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Editorials.

THE PROPOSED ANNUAL REGISTRATION FEE.

THE above subject was one of the principal items discussed at the recent meeting of the Council of the Royal College of Veterinary Surgeons. The result of the discussion was the appointment of a small Committee to consider the advisability of taking the opinion of the profession on the matter, and in the event of their decision being in the affirmative, they are empowered by the Council to take steps to ascertain that opinion. The outcome of this step will probably be the one suggested by the President, namely, a poll of the members of the profession. It is suggested that a short summary of reasons for and against the proposal will be included in the circular, and that the Member of the College shall plainly indicate his approval or otherwise in the monosyllabic answer of either "yes" or "no." We hope the Committee will decide to take that step, as it seems to us the only method by which a general opinion can be taken. It is also to be hoped that they will act speedily and get out the circular almost immediately, in order that the Colonial members of the profession may be enabled to record their approval or otherwise. For that to be done the Committee cannot expect all the replies to be back before the end of September at the earliest. But that should be quite soon enough to enable them to present the result of the poll to the Council meeting in October.

There have already been a number of discussions on the matter, but a further discussion and exchange of ideas might assist waverers to a decision. That is the opinion of the Council of the Veterinary Medical Association of Ireland, who propose to organise a discussion on the subject at the August meeting, and to ask all members of the profession, whether members of the Association or not, to be present, if possible, on that occasion to

voice their opinions. We understand that other Societies and Associations are to be invited to send delegates in order that the meeting shall be as representative as possible. The meeting is to be held at the Royal Veterinary College of Ireland, Dublin, on the evening of August 27, and as that is the first day of the great Dublin Horse Show, it is hoped that large numbers of veterinarians will be present. There are great attractions in Dublin at that time, as, in addition to the Horse Show, there is also a most successful, entertaining, and instructive International Exhibition in progress. We suggest that under these circumstances those who indulge in an annual holiday cannot do better than to make Dublin their resort, and the last week of August the time, thus combining pleasure with an earnest attempt to assist in the solution of this important professional question. We have already expressed our opinions as being unreservedly in favour of the proposed registration fee, as it will enable the Royal College to be placed in a sound financial position, and we hope when the time comes that the majority of our professional brethren will be of the same opinion.

THE PROPOSED TESTIMONIAL TO MR. HUNTING.

WE wish to draw the attention of our readers to the proposed testimonial to Mr. W. Hunting, F.R.C.V.S., as announced in our correspondence columns. It is hardly necessary for us to say anything in support of the suggestion, as we believe it only requires to be intimated to bring in a ready response. Mr. Hunting is so well known and so highly respected that we feel convinced that most of his professional brethren will gladly welcome the opportunity of showing in some tangible way their great appreciation of the enormous services he has rendered to the profession during his association with our contemporary, the *Veterinary Record*. Mr. Hunting has been our steady and unflinching champion for years, and his observations on current topics have always been looked forward to with interest and for guidance, this being largely due to his great grasp of detail and wonderful foresight. His readiness to assist the various Veterinary Societies by coming forward at short notice and by providing profitable material for discussion, and his services to the National Veterinary Association are proverbial. We look forward to a ready response to the invitation to recognise his great services, and are quite sure that the result will be worthy of the profession.

Original Article.

RECENT EXPERIMENTS WITH SERUM VACCINE AGAINST STRANGLES IN HORSES.

BY MM. DASSONVILLE AND F. DE WISSOCQ.*

Preliminary Considerations.

It is a well known fact that few horses escape strangles. They usually contract the disease when they are first put to work, *i.e.*, before 5 or 6 years old. This first attack confers a certain immunity which is frequently sufficient to protect the horse from another attack.

For this, however, it is necessary that the animal, after it has recovered, should not remain in immediate contact with horses affected with strangles. When a young horse which has had strangles is placed in contact with adult animals which have not had the disease, he is practically under the shadow of a fresh attack, whilst the malady frequently attacks him again if he remains in contact with affected animals.

Amongst the cavalry squadrons (which comprise only aged horses *i.e.*, horses which have had strangles) the disease is seldom seen; on the contrary, aged horses frequently do become infected when placed with affected animals, and it is not rare for the same horse to contract the disease two or three times in the same year. The following example will perhaps show at once the influence of acquired immunity as the result of the natural malady, and that in relation to immediate contact during an epidemic. In the course of last winter a serious epidemic of strangles made havoc with horses of the 27th Dragoons. Forty-one horses had already contracted the disease before proper measures were taken to stamp it out. All were so-called *effectives* (*i.e.*, aged horses in the line), purchased since January 1, 1905. They had not been in the remount stable, but were placed amongst the fighting squadron according to their age and in the order of their arrival, so that the *effectives* of 1905-6 comprised 115 horses. Now among these 115 horses fifty-three had already had strangles before their arrival in the corps, and nine contracted the malady again in a benign form; sixty-two others had never had the disease to our knowledge, of these two died, whilst thirty others took the disease in a more or less severe form. Moreover, one finds these facts constantly recurring in reports of observations made in our veterinary infirmaries, showing that strangles, naturally contracted, procures a relatively sufficient immunity for all practical purposes, since it permits the utilisation of horses in centres which are not exclusively centres of affected animals, and if they do happen to become reinfected, they have a benign form of the disease. However, the degree of immunity must vary with the intensity of the complications produced in the animals by the natural malady.

Before the streptococcus of Schütz was known, strangles was recognised as a necessary disease, whereby the organism threw off its prejudicial humours, and in support of this argument it was said that

* For the translation of this interesting communication we are indebted to Mr. G. A. Banham, F.R.C.V.S.

angina, pneumonia, pleurisy (in fact, all pyogenic affections) were very rare in animals which had had natural strangles producing a large quantity of healthy pus.

Since then our opinion as to the nature of strangles has changed, although the facts remain the same. Like the old veterinarians we continue to think that strangles naturally produced is advantageous on account of the results. Finally, it is evident *á priori* that immunity consequent upon an attack of natural strangles, even a very severe one, cannot for certain protect every animal attacked, if it remains in contact with animals suffering from strangles. In fact, this immunity is in some way due to the quantity and the virulence of the streptococci which have penetrated the system. But what affinity is there between the quantity of streptococci which penetrate the lymphatic system producing abscesses, and those streptococci which develop on the surface of the mucous membrane and cast out with the discharge which they excite? What relation exists between the virulence of the streptococci which invade the tissues and those which have been isolated from the discharge?

It is not possible to give a rigorous and precise law on this point, but it is quite certain that in the greater number of cases the discharge eliminated by the nasal cavities is much more abundant than the pus collected in the abscess, and that this discharge contains more streptococci than does the pus from the abscess, and that the streptococci of the nasal discharge are more virulent than are those isolated from pus. When we consider the conditions of contamination to which horses are subjected, it shows that those conditions are singularly dangerous. A horse may lick the nostrils of his neighbour, and if he touches the food upon which his neighbour has blown the discharge from his nose, he may introduce virulent products into his digestive and respiratory systems, sometimes in great quantity, and of course more severe than those of the first attack which had imuunised him. A horse which has had strangles is liable to become subsequently affected by unlimited doses of virus; therefore one can conceive that the acquired immunity is not absolute. Experience shows, however, that this immunity is practically sufficient, since in the *effectives* (*i.e.*, horses who have already had strangles) the disease hardly ever appears.

The problem of the fight against strangles does not consist of vainly seeking to induce an absolute immunisation of young, susceptible horses from contracting the disease, but rather to confer on them an immunity as near as possible to that induced by a natural attack of the malady; in other words, to give them the benefits the latter produces without the serious consequences. If we could obtain such an immunity without appreciable danger and inconvenience, comparative as it may be, the advantages would be much the same as those given by the vaccines in common use against other diseases, which, however, are not absolutely effective, but are practically sufficient.

For example, take vaccination in man: no one doubts it acts as a preventive against small-pox, but would it permit those who had been vaccinated to live in the midst of small-pox patients, under the same conditions as those to which a horse is submitted when placed in contact with strangles? But has it not been sufficient to make small-pox comparatively rare? It is true that small-pox patients are regu-

larly isolated. If, however, it became an established fact that preventive treatment against strangles was equivalent to natural immunisation (which is quite as marked as vaccinal immunisation) it would be sufficient to isolate the diseased animals, and the latter would inevitably become more and more rare, because the ravages caused by strangles would then be no more feared than small-pox. We are, however, far from this, for the disease which is most injurious at present to the production of horses is undoubtedly strangles.

It was after taking into consideration the general conditions just exposed that we attempted to produce a preventive for this malady, and tried to produce an immunisation of young horses against the streptococcus of strangles, but—and we insist on this point—our end was not to seek to procure an absolute immunity which is permanently to resist all infection (this being in our opinion impossible), but rather to confer on young horses an immunity somewhat equivalent to that which is generally procured by the natural malady, which is practically sufficient.

Experimental Part.

In a former work* we showed that a very marked immunity can be obtained against the strangles streptococcus by injecting horses with cultures of this streptococcus under certain conditions in increased doses. For two years our experimental horses (ten in number) did not present any appreciable trouble if we injected into the jugular 100 to 150 cc. of a culture, which, in a dose of 2 cc., produced in a fresh animal a high thermal reaction, accompanied by very serious abscesses, synovitis, arthritis, strangulous eczema; and in doses of 10 to 12 cc. might in a few hours terminate fatally. That is to say, strangles produced experimentally produces a refractory state, like spontaneous strangles; but it must still be understood the immunity is not absolute, since with a sufficiently strong dose it is always possible to kill an immunised animal which will easily take 150 cc. of culture concurrently injected. But this immunity is necessarily much more pronounced than the immunity following that of natural infection, because it permits an animal to resist the action of several doses somewhat excessive for aged horses.

When we commenced the inoculation our experimental horses enjoyed a natural immunity, being aged from 7 to 11 years, and they had already had strangles. In spite of that they became affected from the first subcutaneous injection of only 2 cc. From the intensity of the effects produced in these horses by the culture, even in weak doses (2 cc.), we judged that an immediate vaccination of young horses, even of a weak virus, would not be practicable. The horse is so susceptible to the streptococcus of strangles that there is always danger in injecting cultures of this microbe, even in weak doses. We must, then, find some proper means of placing the constitution of the young horse in a state of resistance—at least temporarily—and to profit by the moment when this state is attained to inject the vaccine culture, susceptible of producing a durable refractory state. To this end we tried to find out if, by injecting young horses with serum taken

* "First Trial of Serotherapy and of Serum Vaccine against Strangles in the Horse." *Bulletin Soc. Cent. Vet.*, April 30, 1905.

from animals which had been immunised to a high degree, we could not establish such a state of temporary resistance. Our first experiments for this purpose were carried out at the stables of the Compagnie Générale des Petites Voitures. We had twenty horses, distributed in five lots. The first lot received subcutaneously 5 cc. of serum; the second, 10 cc.; the third, 15 cc.; the fourth, 20 cc.; and the fifth, 30 cc. Some days after each horse was injected with the same vaccine in doses varying from 3 cc. to 5½ cc. Those which received the largest quantity of serum were injected with the strongest dose of vaccine. Now in the latter there was no thermal reaction, and the local manifestations were insignificant. In those which received the weaker doses of serum the thermal reaction was much more severe, and the local reactions (formation of abscess) were much more obvious in the subjects which had received less serum. Nevertheless, when the dose of serum was weak the thermal and local reactions were never so accentuated as those produced in aged horses unprepared by serum, and that had been subcutaneously injected with 2 to 3 cc. of the same vaccine. It seems that the serum produces at least a transient immunity which permits an injection of the streptococcus without danger, and that the immunity produced is somewhat proportionate to the quantity of culture inoculated. The twenty horses of the Compagnie Générale des Petites Voitures having received some vaccine it remained to be seen whether they were really immunised or not, and, if they were, to what extent. For this purpose it was necessary to closely observe these animals. In order to establish a percentage of those which would have taken strangles, the percentage of the other young horses of the company becoming affected might justly be considered as controls, and thus see if the vaccine had conferred immunity; but this was not possible, because we could not trace the animals; moreover, the number of horses vaccinated was not sufficient to draw conclusions. In experiments of this kind a large number of subjects are necessary before we can say whether immunity has been conferred, and whether it is of any practical use. Also, whether it is necessary to risk strengthening the serum in order to be able to inject a stronger dose of vaccine,* and so produce a more marked resistance.

We thought it would be desirable and profitable to submit a large number of horses to sero-vaccination (anti-strangles), and we therefore communicated the result of our first trial of serum vaccine to the Minister of War, offering to experiment in the remount depôts if he would allow it. In reply he, on the advice of the Commission of Medical and Veterinary Hygiene, decided that a trial of serum vaccine against strangles should be undertaken in the horse depôt at Suippes, according to a programme approved by Dr. Roux, Director of the Pasteur Institute and the permanent Inspector-General of Remounts. The programme agreed upon by Dr. Roux and adopted by the Inspector-General of Remounts was as follows:—

(1) The Minister of War having given permission for sixty horses to be employed for the experiments, these were chosen under the direction of M. Dassonville from young horses having a normal temperature for six consecutive days.

* It is useless to say we did not wait for the result of new experiments to strengthen our serum. We actually injected 7 to 8 cc. of vaccine without producing any thermal reaction or appreciable organic reaction.

(2) The horses to be vaccinated shall first receive an injection of anti-strangles serum in doses fixed by M. Dassonville; then they will undergo a subcutaneous inoculation of the culture of the streptococcus of strangles in a dose approved by M. Dassonville. Forty horses will be immunised as above, and will afterwards be placed with an equal number of control horses in contact with horses recognised to be suffering from strangles.

(3) Twenty horses will receive 40 cc. of anti-strangles serum, and will then be left in contact with affected horses at the same time as twenty control horses.

(4) In order to allow M. Dassonville to estimate the virulence of the culture of the streptococcus of strangles, three young horses chosen from among injured horses, or those of little value, will be placed at his service.

Thus it is seen that this programme comprised (1) Preliminary disposition relative to the estimation of the degree of virulence of the culture to be employed for the inoculations; (2) Experiments: First, serum; second, sero-vaccine.

(1) Preliminary Details Relating to the Estimation of the Degree of Virulence of Cultures.

According to paragraph 4 in the programme, three horses—Vol au Vent, Centaire, Australine, were put at our disposal.

In each of them we injected cultures of different origin, 4½ cc. of the culture we had already used at the Compagnie Générale des Petites Voitures. The injection produced in Vol au Vent an enormous abscess 40 c. long, 28 c. broad, 8 c. thick in depth, and a very marked rise in temperature which lasted more than twenty days, and as we estimated that the virulence of this culture responded to our requirements, we decided to use it for the vaccination in doses of 4 cc., each horse having been previously prepared by an injection of serum.

(2) Experiment—General Details.

The animals which served for these experiments were aged 3, which had arrived at the horse depôts since July 15, 1905, and were to remain there until September, 1906. Thus they were under observation for a year, and there was no interruption during the winter season. The arrival of the horses at the depôts being successive, the inoculations had to be gradually arranged. The serum treatment was carried out on August 2, 3, 10, and 17, 1905, and the vaccinations on August 16 and 17, 1905.

(1) *Serum Treatment.*—This was only carried out on horses which had not presented any symptoms of strangles, the temperature having remained normal for six consecutive days.

Of 175 horses that arrived at the depôt from July 15 to August 29, only 104 satisfied the conditions of the experiment. These 104 were distributed on five farms, viz., thirty-two at the farm of Jonchery, twenty at Vadenay, ten at Piémont, twenty-four at Suippes, and eighteen at St. Hilaire. Half of these horses (say fifty-two) received, from August 2 to 17, anti-strangle serum in doses of 30, 40, 50, and 60 cc. The other half comprised the test horses. Those treated with serum and the tests were classed, without any choice on our part, alternately, according to the number of inscription and order on the

register of the depôt. Each test was placed side by side with the serumised next number, and kept those places until the end of the experiment. In all the horses the injection of serum produced the development of a slight œdema, which was reabsorbed at the latest in forty-eight hours. We did not notice any elevation of temperature nor any appreciable organic disturbance.

Of the fifty-two horses serumised, fourteen were not submitted to any further operation. The latter constitute, with the fourteen test horses, the experimental lot relative to serumisation.

(2) *Serum Vaccine.*—The other thirty-eight were vaccinated, and, with their thirty-eight test horses, constitute the experimental lot relative to serum vaccination.

The culture was injected, as we have already said, in 4 cc. doses; the vaccination was performed on twenty-three horses twelve to fourteen days after the serum treatment, and on fifteen horses six and seven days after the injection of the serum.

Following the injection of the culture, the temperature rose to a perceptible degree in most of the horses, nevertheless, it did not rise above 39·5° C., and became normal in two days. Here is one of the most frequent examples:—

Temperature	at time of injection			(morning)	37·6° C.
,,	12 hours	after	,,	(evening)	39·3° C.
,,	24 ,,	,,	,,	(morning)	37·8° C.
,,	36 ,,	,,	,,	(evening)	39·4° C.
,,	48 ,,	,,	,,	(morning)	37·5° C.

After this the temperature did not rise above 38° C. The general symptoms produced by the injection of 4 cc. of culture were more acute, and the duration of their manifestations was relatively short (three or four days at most).

At the points of inoculation œdemas were produced, which in thirteen horses were absorbed in forty-eight hours.* In the other twenty-five horses we noted the appearance of small abscesses, in size varying from a nut to a small hen's egg, which, after puncture, cicatrised very rapidly (forty eight hours) without leaving any trace. Two horses, however, proved an exception to this; in these the injection, made at the lower part of the shoulder, and also perhaps too deeply, gave place to the production of an abscess which healed slowly, and in one case was very large (the size of two double fists).

In the course of the experiments at Suippes we, with the veterinary surgeons at the depôt, proved that the abscesses (when they form) are rapidly healed when the vaccination has been performed high enough on the shoulder ($\frac{2}{3}$ above). It is not so when the vaccine is injected $\frac{1}{3}$ below this region, above all in the immediate locality of the free edge of the shoulder; at this spot, perhaps on account of the great laxity of the conjunctive tissue, the abscess is deeply formed, and puncture can only be made with a cautery if one wishes to avoid a large wound, which would necessarily entail a tardy cicatrisation.

In the higher part, on the contrary, the abscess points rapidly,

* Amongst these thirteen horses, six had received serum taken at the time when the horse utilised for the production of it was at its highest state of immunity. The other seven had received doses of serum relatively strong (two received 60 cc., one 55 cc., four 40 cc., the greater number receiving only 30 cc.

especially if one has been careful to inject the vaccine directly under the skin, without wounding the aponeurosis and adjacent muscles; its development takes place on the surface of the skin, and, lanced at the surface of the epidermis, the cicatrix is complete in two days.

RESULTS ACQUIRED NINE MONTHS AFTER THE COMMENCEMENT OF THE EXPERIMENTS.

FIRST LOT OF HORSES TREATED WITH SERUM.

This lot comprised twenty-eight horses (fourteen treated with serum and fourteen control horses). In the table below the horses are placed according to the respective places which they occupied in the stable. Those which became infected with strangles (whether as tests or as horses treated with serum) are printed in italics.

No. of days of illness	Date of illness	Horses treated with serum	Test horses or controls	Date of illness	No. of days of illness
		FARM AT SUIPPES.			
9	Sept. 18 to 27	*Chablis*	*Cartonnier*	Aug. 29 to Sept. 14	16
		Chaudelle	*Clamart*	Sept. 11 to 28	17
16	Sept. 7 to 23	*Chasseur*	*Carnage*	Aug. 11 to Sept. 14	34
16	Sept. 7 to 23	*Canot*	*Coquelicot*	Sept. 29 to Oct. 22	23
		Charlaton	Corails		
		Chéron	*Conscrit*	Aug. 18 to Sept. 8	21
		FARM AT VADENAY.			
		Cabaret	*Papillon*	Aug. 24 to Oct. 10	47
14	Oct. 5 to 19	*Carquois*	Clandestine		
		Chartreuse	*Cacatoes*	Nov. 9 to 25	14
		Cadrau	*Coquet*	Sept. 6 to Oct. 8	42
		FARM AT PIÉMONT.			
		Chambertin	*Coco*	Nov. 15 to 27	12
		Cabestan	Sans-Peur		
		FARM AT ST. HILAIRE.			
		Cobraïn	*Caprice*	Nov. 25 to Dec. 19	24
		FARM AT JONCHERY.			
		Chablis	*Clarisse*	Mar. 24 to Apl. 1	7

From the examination of this table it appears that (1) of fourteen horses treated with serum four became affected with strangles, viz., 28·57 per cent. (2) Of fourteen control horses eleven became affected, viz., 78·57 per cent.

The duration of the malady, &c.*, for those treated with serum was fifty-five days, or less than fourteen days per horse. For the test horses (*temoins*) it was two hundred and fifty-seven days, or rather more than twenty-three days per horse.

(3) In no case did strangles appear in the serum-treated horses before it appeared in their immediate neighbours.

At the farm at Suippes, *Chablis* has as sole companion *Cartonnier*, who had recovered from strangles five days before *Chablis* took it. *Chasseur* and *Canot* were the two neighbours of *Carnage*, who was attacked with a severe angina strangles; they took the disease on the same day (September 7) seven days before the definite cure of *Carnage*, from whom they became infected. At the farm of Vadenay, *Carquois*, neighbour to *Papillon*, took strangles on the forty-second day of the illness of the latter. Thus the horses treated with serum did not take any part in the infection of their immediate neighbours. It is not so with the three horses—*Cartonnier*, *Carnage*, and *Papillon*—which became infected, and seemed to have provoked the disease in the four horses treated with serum which were in contact. One may then ask, What would have happened if it had not been for the control horses being susceptible to contract strangles, and afterwards to spread a large quantity of virus to their neighbours (the serumised animals)? Under these conditions this lot of fourteen horses treated with serum would probably be immunised from strangles, and consequently the serum would appear to exercise a much stronger immunising action. This manner of procedure, however, which could be done practically, could not be done experimentally. To make sure that the anti-strangles serum is preventive, we had to place an equal number of subjects treated with serum (serumised horses) and of test horses under exactly the same conditions. The serumised horses, however, are under a disadvantage when compared with the control horses, since the latter were the agents of contamination, whereas the former were not. Therefore this must be taken into account when interpreting the results.

Second Lot of Serum Vaccine Results.

For the serum-vaccine experiments seventy-six horses were used, thirty-eight treated with serum vaccine, thirty-eight tests. In one of them, Caleçon I., vaccinated on August 16, a bad cough was noticed two days after, followed by a discharge, unmistakably strangles. This animal, at pasture, was continually with *Cantinière*, which was suffering from strangles and had been discharging for several days. Thus *Caleçon I.* was not immunised but suffering from both produced and natural strangles, and it was impossible to separate the influence of the vaccine from that of spontaneous infection on the immunisation, which could not have acted so quickly. It was thus necessary—and the veterinary surgeons of the farms who followed the experiments agreed with us on this point, viz., that *Caleçon I.* with his test companion, *Cantinière*, ought to be withdrawn from the experiments.

* The duration of the malady is estimated as follows. For our purpose it commences when the temperature—taking morning and evening during the whole time of the experiment—deviates from the normal, and finishes when all objective symptoms have disappeared and the temperature has become normal. The rectal temperature generally rises before any objective symptoms appear, on the other hand there is a closer coincidence between the disappearance of the objective symptoms and the return to the normal temperature.

Thus the number of the serum-vaccine horses was reduced to thirty-seven, with thirty-seven test horses.

The table below, arranged in the same manner as for those treated with serum, gives the result up to April 1, 1906, after which no case of strangles was observed among the lot.

No. of Days' Duration	Time of illness	Horses treated with serum	Test horses or controls	Time of Illness	Duration of malady
		FARM AT SUIPPES.			
		Chalut	*Cambyse*	Sept. 18 to Oct. 12	25
		Caporal	*Volcan*	Sept. 7 to Oct. 19	42
		Cailleteau	*Lady Kilaire*	Sept. 9 to Sept. 22 Oct. 26 to Nov. 27	39
20	Oct. 6 to Oct. 26	*Charlotte*	*Carl*	Sept. 21 to Oct. 12	21
		Carapon	*Cavalier*	Sept. 22 to Oct. 15	23
		Chicanerie	*Casaquin*	Sept. 15 to Oct. 22	37
		FARM AT VADENAY.			
	Sept. 22 to Sept. 28	*Condor**	*Conscience*	Sept. 16 to Oct. 30	34
		Plaisante	*Calchas*	April 25 to Oct. 2	7
		Turlurette	Cahorsin		
		Copain	*Capucine 1st*	Sept. 15 to Oct. 14	29
		Carrossier	Clodion		
		Rosette	*Clotilde*	Sept. 13 to Sept. 22	7
		FARM AT PIÉMONT.			
		Cosaque	*Caen*	Nov. 30 to Dec. 30	30
		Carabine	Champ de Mars		
		Clairon	Calembour		
		FARM AT ST. HILAIRE.			
19	Nov. 11 to Nov. 30	*Cora I.*	Campos		
		Criquette	*Cantinière*	Aug. 4 to Sept. 20	46
13	Nov. 15 to Nov. 28	*Zephir*	*Carrousel*	Nov. 2 to Nov. 18	16
		Cadillac	Caleçon II.		
		Conquérant	*Liloff*	Nov. 2 to Dec. 2	30
		Cabeston	Chambrière		
		Gournay	*Cabillaud*	Nov. 27 to Dec. 2.	5

* On this day the horse next to Caleçon I. was withdrawn from the experiment, having had strangles since November 7.

FARM AT JONCHERY.

In this farm, at the end of January, the lot was still free from strangles. After a vain attempt at contamination, from November 8 to November 14, 1905, by bringing into the stable a horse with strangles, the trial was repeated with an infected horse which, from February 1 to 5, 1906, was allowed to run with the horses of the lot, but was taken away at feeding times, and also at night.

No. of Days' Duration	Time of illness	Horses treated with serum	Test horses or controls	Time of illness	Duration of malady
			STABLE I.		
		Crenul	*Mina*	Feb. 8 to March 29	45
		Cafard			
		Cacao	*Constantine*	Oct. 6 to Oct. 14 Feb. 22 to April 4	50
32	Feb. 13 to March 17	*Camarade*	*Cherbourg*	Feb. 12 to Feb. 25	13
10	Feb. 21 to March 3	*Casaquin*	*Carnac*	Feb. 7 to Feb. 18	12
		Canicule	*Caméléon*	Feb. 7 to Feb. 27	20
		Folette	*Caramel*	Feb. 9 to Feb. 24	16
17	Feb. 14 to March 2	*Cyclonière*	Cassis		
		Caen	*Arlette*	Feb. 10 to Feb. 22	12
		Etendard	Calambac		
21	Mar. 12 to April 2	*Coquette*	*Dragée*	Feb. 10 to Feb. 25	15
12	Feb. 10 to Feb. 21	*Cahotage*	Forbau		
			Caleçon	Feb. 10 to March 2	20
			STABLE II.		
15	Mar. 1 to 15	*Cachalot*	*Collette*	Feb. 12 to Mar. 24	40
		Rapida	*Calambart*	Mar. 14 to Mar. 24	10
7	Mar. 24 to April 1	*Consulaire*	Cornic		

It is expedient to add to the above tables the observations made by the veterinary surgeons of the depôts on the severity of the cases of strangles during the experiments. In a former report to the Minister of War, dated December 22, 1905 (at the end of which period strangles had not been detected in the horses treated with serum-vaccine, except at Jonchery), the Veterinary-in-Chief to the regiment and chief of the veterinary staff of these establishments wrote thus :—

"Thirty-nine horses* treated with serum-vaccine have furnished four cases of strangles, mostly benign. Fourteen horses treated

* The Veterinary-in-Chief of the regiment counted in this number Caleçon I., withdrawn from the experiment, as stated above ; also a horse *Clamart*, which *died* from traumatic peritonitis.

with serum vaccine furnished three cases of strangles, usually benign. Fifty-three test horses (*témoins*) supplied sixteen cases of strangles, of which five were serious."

Dated April 1, 1905, the results of the whole were modified by the return of the malady at the farm of Jonchery. The results consigned from this farm by the Veterinary-in-Chief were as follows:—Of fifteen horses treated with serum vaccine, seven horses had strangles, but no serious cases. Of fifteen test horses, eleven became ill with strangles, three grave cases.* In short, at the end of the experiment the relative severity of cases is summed up thus:—Of thirty-seven treated with serum vaccine, no serious cases occurred. Of thirty-seven vaccinated control horses (*témoins vaccinés*) eight cases of strangles occurred, which were severe, or 21·62 per cent. severe cases.

An examination of the above documents reveals the facts:—(1) That of thirty-seven serum-vaccinated cases eleven took strangles—say, a proportion of 29·72 per cent. cases of strangles, and none of them serious. Of thirty-seven control horses, twenty-six took strangles—say, 70·27 per cent. of strangles, 21·62 per cent. of which were severe. (2) The duration of the malady was, for the number of serum-vaccinated horses, from 182 days, about sixteen and a half days per horse. For the control horses (*témoins*) 644 days, nearly twenty-five days per horse. (3) In no case has strangles appeared in the serum-vaccinated before appearing in the control horses placed by their side.

Thus at the farm of Suippes, in the mare *Charlotte* (the only animal treated with serum vaccine on this farm which took strangles) the first symptoms appeared on October 7. This mare was placed between two control horses, *Lady Kilaire*, which took strangles on September 3, and persistently discharged until October 9, and *Carl*, whose illness began September 23, and was still discharging on October 9.

At Vadenay, *Condor* became affected with strangles on September 22, perhaps about six days after its neighbour, *Conscience*; further, two other test horses on the farm had strangles from the 13th to the 15th of the same month.

At St. Hilaire, *Cora I.* took strangles on November 11. Its control horse remained immune, but in the stable *Cora I.* was beside *Caleçon I.* (the horse withdrawn from the experiments), which had been ill for four days.

Finally, at Jonchery, the progress of the epidemic was as follows:—After contamination (see observation table 2) caused by the introduction of a diseased horse from February 1 to 5 into the stable, the malady appeared five days after, viz., February 10, in a serum-vaccinated horse, *Cahotage*, and in his control horse, *Calembour*. Both were evidently contaminated at the same time by the introduced animal. The same may be said of *Camarade* (serum-vaccinated), who took strangles on February 13, and his control horse, *Cherbourg*, who took it on February 12.

The others, treated with serum vaccine, which had strangles, developed it more or less slowly, and always after it had appeared in the control horse. Then *Cyclonière* had a temperature four days after the appearance of the objective symptoms in the test horse *Arlette*;

* The horse *Mina* had to undergo tracheotomy; *Constantine* had an abscess at the anus, which discharged a pint of pus; *Calembour* succumbed to the serious complication of anasarca.

Casaquin, placed between *Caméléon* and *Carnac*, took strangles when the latter had been discharging for twelve days; *Coquette*, neighbour of *Dragée*, ten days after the latter healed and ceased to discharge; *Cachalot* seventeen days after his neighbour *Collette*; *Consulaire* exactly at the time when his neighbour, *Calambart*, was considered cured.

It thus appears on one side as if the horses treated with serum vaccine were all contaminated by their control companions, and, on the other side, that the former never exercised any influence on the latter. Thus it seems the control horses alone became infected from the media (*i.e.*, the infected horses introduced), which were insufficient to produce strangles in those which had been vaccinated, and the latter contracted it from their neighbours. These facts are similar on all points to those which we verified in connection with serumisation pure and simple, and the results are the same.

Résumé.—The new experiments which were carried out by the order of the Minister of War from July 15, 1905, to April 1, 1906, at the horse establishment of Suippes gave results which may be summed up thus:—*

(*a*) 28·57 per cent. of horses treated with serum only became diseased; 78·57 per cent. of the horses which had had strangles (naturally) became infected.

(*b*) 29·72 per cent. of horses treated with serum vaccine took strangles in a form exceedingly severe (21·62 per cent.).

Conclusion.

Both the serum and serum-vaccine treatment have given equally good results. It is to the serum-vaccine, however, that it is agreed to give the most deserving character, (1) because it acted on the greatest number of horses (thirty-seven instead of fourteen); (2) because the animals treated with serum vaccine suffered most severely in the two principal lots; at Suippes, where all the tests had the disease; at Jonchery, where the disease was rife in mid-winter under the severe form peculiar to those seasons.

Remarks.—The mixing of the vaccinated with the control animals accounts for the first of the particularly unfavourable conditions; the test animals took the disease solely from the infected medium, and they then transmitted it to the vaccinated subjects by distributing large quantities of strangles virus. The vaccinated horses, on the contrary, seem to have never taken the disease through the single influence of the medium, but solely by prolonged contact with their neighbours which had developed strangles, and they never infected their neighbours, since the latter always became infected first.

It appears evident that the serum vaccine would have been still more advantageous if, instead of an experiment, it resulted from a practical application carried out on serum-vaccinated horses only.

(*a*) Finally, the proportion of serum-vaccinated horses which became infected in the locality of control horses with strangles is sensibly the same as that of horses which, having already had the malady,

* These results have not changed since April. The experiment in reality is now a year old.

contract it afresh when they are placed in the midst of horses suffering from strangles.

It seems that they have acquired an immunity almost as great as that produced by the natural malady, which is practically sufficient.

(*b*) We will only add that this trial of serum-vaccine did not cause any accidents, and that analagous new experiments, carried out on hundreds of horses, show that there is no danger.

We beg MM. the veterinary surgeons of the horse depôts of Suippe, M. Schelemeur, chief of the staff, MM. Gay, Tasset, Waskowitz, Fergeot, Dupré, Mourer and Boit, who lent their valuable aid to these experiments, to accept our sincere thanks.

Clinical Articles.

ABDOMINAL WOUND IN A MARE, WITH PROTRUSION OF UTERUS AND BOWEL—RECOVERY.

BY J. MCKINNA, F.R.C.V.S., HUDDERSFIELD.

THE subject was an aged dark brown mare running at grass with another horse. In attempting to jump a wooden fence she got badly staked in the abdomen, the injury causing the internal organs to protrude. When seen by my assistant (Mr. D. MacLeod, M.R.C.V.S.) about two hours after the accident, the mare appeared very much distressed, sweating profusely and blowing. On examination, it was found that the wound was situated in the right groin, between the mammary gland and leg, and was from 5 to 6 inches long in its outer aspect. The protruding organs consisted mainly of the uterus and floating colon, which were now highly congested. Prognosis was unfavourable, but at the owner's desire treatment was taken in hand, the parts were washed first in a warm solution of creolin, and afterwards in warm hydrarg. perchlor. (1 in 1,000). A strong towel saturated in the same fluid was used to support the parts. An attempt was made to return them in the standing position, but this was found to be impossible. She was then cast and turned on to her back in the position of castration in the male; the off leg was taken out of the hobbles and stretched outwards and backwards. Great difficulty was experienced in returning the organs, the internal opening being much less than the outer. With careful pressure externally and gentle traction internally (*per rectum*) they were returned in about half an hour. As the internal wound could not be reached to allow stitching, the opening was well dusted with a dry dressing, and packed firmly with absorbent wool, and the external (skin) wound stitched with double silk sutures. Shortly afterwards the mare was allowed to get up, and walked with difficulty into a box prepared in the field. She very soon lay down and showed symptoms of colic. A sedative draught was administered, and a morphia suppository left with directions to be administered if the pain got worse during the night. On visiting her next morning the pain had subsided, but she appeared very dull, and diarrhœa had set in. The temperature was 102·4° F., and pulse 52. The outer wound looked very nice, with little or no

swelling. A small bran mash and a little long hay were ordered and eaten with considerable relish. At night the temperature had risen to 103° F., but otherwise the mare was doing as well as could be expected. On the following day, although the temperature had risen to 104·2° F., and the pulse to 60, she appeared much more comfortable, and ate fairly well. The wound had still a healthy appearance, with little or no odour or discharge, but the leg was beginning to fill, especially at the hock.

Treatment consisted in dusting the wound several times daily, and the administration (in the drinking water) of salines and antiseptics. On the third morning some of the stitches were removed, and the wool extracted. The wound was then thoroughly irrigated with hydrarg. perchlor. (1 in 1,000) plugged with dry dressings. This was continued night and morning. The temperature had now fallen to 102° F., and pulse 48. This course of treatment was persevered with for a fortnight or so. Healing gradually took place, and from this time recovery was uninterrupted, taking exactly a month from the day of the accident until the mare was again turned out to grass.

PARTURIENT LAMINITIS IN A COW.

BY HENRY B. EVE, M.R.C.V.S., FOLKESTONE.

Subject.—A cow, aged 3, in plethoric condition, the property of a Kentish dairy farmer, who bred her.

History.—The cow had been delivered two days previously by the cowman of a dead calf without much trouble, but she had not cleansed properly. It was the third time of calving.

Symptoms.—When the cow was standing in the byre the symptoms were similar to those noted in the horse; the animal appeared quite incapable of moving, and when made to do so as a result of a shepherd's dog being brought into the byre, it was self evident that the weight of the body was thrown on the heels, the former being as it were swung from side to side as the limbs were advanced, each one being moved with a kind of general body effort. The animal evinced unmistakeable signs of being in pain, as evidenced by the anxious expression of countenance. The hoofs were hot, sensitive to the slightest touch and painful on percussion, the internal claws seeming more affected than the external. There were the usual signs of general constitutional disturbance present, *viz.*, loss of appetite, wasting, dry muzzle, high temperature, 106°, hurried respiration, pulse quick, excessive thirst. The cow usually lay in the recumbent position, and when down had great difficulty in rising.

Diagnosis.—Parturient laminitis.

Prognosis.—Guarded; feared septic pneumonia would intervene.

Treatment.—I removed the remaining portions of the cleansing manually under antiseptic precautions. I found on exploration that the *os uteri* was dilated, and that the uterus contained a quantity of thick red-coloured fluid which was slightly putrid. I irrigated the uterus twice daily with a warm solution of chinosol and glycerin extract of belladonna, by means of a double catheter. I gave internally a saline

aperient and a febrifuge draught composed of sodæ salicylas, chloric ether, tinct. aconite (Fem.), and tinct. digitalis, every eight hours until the temperature was reduced. Local treatment consisted in the application of cold poultices to all four feet, and also a mustard plaster to the chest. Later I removed the poultices and rubbed stimulating liniment into the coronets, put the cow on sawdust as a bedding, and gave nourishing drinks, stimulants, and tonics in warm ale. The cow in three weeks was convalescent, recovery eventually took place.

Remarks.—I have seen "laminitis" occur in bovines after long railway journeys in crowded trucks when returning from cattle shows, and also after prolonged standing on board ship; and in mares after foaling, but never before in a cow after calving, hence my reason for recording this case, thinking that it might interest others. I came to the conclusion that the cause of the disease was undoubtedly "septic" in origin, and due to absorption of the uterine fluids.

LIPOMA OF THE PERINÆUM AND FIBROMA OF THE MAMMARY GLAND OF A BITCH.

BY F. A. HENEY, M.R.C.V.S., DUBLIN, AND GEO. H. WOOLDRIDGE, PROFESSOR IN THE ROYAL VETERINARY COLLEGE OF IRELAND.

THE subject was an aged dachshund bitch, which was brought in for advice as to whether she should be destroyed on account of two swellings in her perinæum and mammary gland, and her advanced age, or whether operation might be successfully carried out. She had been previously examined about the middle of January last, and at that time there was a small rather soft swelling in the perineal region, about the size of a walnut. There was no observable lesion at that time in the mammary gland. The owner did not wish to take any unavoidable risk, as the bitch was a great favourite; consequently, as there was no evidence of inconvenience or discomfort, he was advised not to have it interfered with unless there was a marked tendency to increase in size. We were not consulted in the matter again until this month (July), when the patient presented the following appearances. The original lesion had increased enormously in size, and caused distortion of the perinæum. The anus was displaced in the upward direction, and the vulva to a more marked degree downwards and towards the right side, the swelling occupying the left side of the region. On manipulation it was found to have a soft consistency, and reminded one, both by it and the position, of the possibility of the lesion being a perineal hernia. On further examination, however, no viscus was discoverable, and so the diagnosis of either myxoma or lipoma was made. The question of a soft sarcoma was negatived by the general good condition of the patient. We next directed our attention to the lesion affecting the right penultimate mammary gland. It was hard and dense, with several large veins running over the surface of it. It possessed all the ordinary appearances of the common fibroma of the mammary gland of bitches, and a corresponding diagnosis was made. There was no ulceration of the skin, which, however, was tightly

stretched over the surface, and almost touched the ground as she walked. Operation was advised and accepted.

The bitch was accordingly prepared and chloroformed with a Hobday inhaler, assisted with a little chloroform on cotton-wool held in the mouth of the inhaler. She took the anæsthetic excellently. The perineal tumour was first operated upon, and on dissection it was found to be loosely adherent by areolar connective tissue to the structures of the region. Its vascularity was exceedingly slight, and hæmorrhage was inappreciable. The tumour was clearly lobed, and had two firm attachments, one to the wall of the vagina, and another to the ischial arch. After removal the cavity was plugged with sterilised absorbent wool, soaked in a solution of chinosol gr. i. to ʒ i., and sutured. The mammary tumour was then operated upon and excised. It was fairly vascular and ligatures and artery forceps were applied to control the hœmorrhage, which was, consequently, not copious. The cavity was plugged in the same way as the previous one, and similarly sutured with a continuous suture. The plugs were removed next day, and renewed daily for a while, and recovery was uninterrupted.

On microscopic examination of stained sections, the perineal tumour was found to be a pure lipoma, and the mammary tumour was a fibroma with evidence of commencing myxomatous degeneration towards the centre.

Abstracts and Reports.

NODULAR DISEASE OF THE INTESTINES IN SHEEP.*

BY W. WATKINS-PITCHFORD, M.D.

In March, 1903, Mr. Hutchinson, then district veterinary surgeon at Harding, sent some portions of the small intestine of a sheep to the laboratory for an opinion as to the nature of the disease affecting the gut. He stated that he had experienced a heavy mortality among some sheep under his care, losing as many as seventy-four out of a flock of 450 in six weeks, and that all the bodies which he opened showed the intestines to be affected in the same manner as in the specimen sent.

Since the receipt of Mr. Hutchinson's specimen several other similar specimens from veterinary surgeons and farmers have been sent to the laboratory, and the disease has been made the subject of investigation.

The malady has been found to be quite common in Natal as well as in other parts of South Africa, but as to when it was introduced or whether it is an indigenous disease has not been ascertained. It is possible that information upon these points may still be forthcoming from some of the older inhabitants.

The disease has been for many years a very common one in the Southern States of America, where the cause, a parasitic worm, was first identified and named by Dr. Curtice. It is noteworthy that the

* From the Report of the Government Bacteriologist of Natal.

disease does not appear to have shown itself in Great Britain, or, at any rate, that if it has appeared it has not called for any particular notice in the books which deal with the diseases of the sheep.

In Natal the affection is most troublesome on the low lands near the coast, in valleys, vleis, and on marshy pastures. Although not unknown in the higher parts of the colony, *e.g.*, the districts of Mooi River and Newcastle, it is usually so insignificant there that it escapes the notice of the breeder. This disease seems to be one of the principal causes why sheep do not thrive in the low-lying parts of the colony.

In some parts of the United States the disease is known as "knotty guts," but the more generally accepted, and certainly more academic title, is "nodular disease of the intestines." An accurate designation of the malady would perhaps be "œsophagostomal disease."

It is only in exceptional circumstances in Natal that the disease causes great mortality in a flock. If the grazing be ample, as is generally the case, and the flock never penned on a small space, the disease, if present, continues in a mild form and but rarely causes the death of an animal. If, however, the flock be kept on a small and damp pasture or confined in a yard or shed for a few days, the disease may speedily become exaggerated and may produce many deaths after the lapse of a few weeks, especially among the lambs. If only a single animal be affected and allowed to run with the flock, especially where the pasturage is limited, it is almost certain that all the other animals will develop the malady to some extent.

This disease is communicated through the vegetation of a pasture which has become infected. Animals which suffer from the complaint pass the eggs of the parasite, or the mature parasites themselves, in their dung. By this means the pasture becomes infected, and, provided the ground is fairly moist, the eggs retain their vitality certainly for some months. It is by the eating of grass or other damp food carrying upon it the microscopical eggs of the parasite that a healthy animal becomes infected with the disease.

It appears probable, as the result of observations made upon sheep at the laboratory, that a sick animal can again infect itself to an unlimited extent by feeding upon grass contaminated by its own dung. Thus a sheep suffering but slightly from the disease becomes rapidly worse if confined upon a small space, whereas if the animal be allowed to run free its disease makes hardly any appreciable progress. Lambs which are born upon a small, enclosed pasture which has been infected with the parasite speedily sicken and rarely survive more than two or three months.

The symptoms of œsophagostomal disease are not very characteristic. If the animal be but slightly affected it presents no symptoms beyond slight loss of condition. In some parts of the country where the malady has not yet been recognised by the breeder, it is almost an invariable rule to find a few of the parasitic nodules if the intestines of a slaughtered animal be carefully searched through. These animals have not developed the disease severely because the great extent of their pasturage has obviated the contamination of their food by their own droppings.

When the disease is well developed there is extreme debility and loss of flesh, often accompanied, in the last stages, by diarrhœa. The

degree of emaciation and the severity of the symptoms generally appear to be in direct proportion to the number of nodules in the intestines.

If the body of an animal which has died from the disease be opened the outer surface of the intestines will be found to be studded with numerous hard nodules, which are usually of a rounded shape but sometimes have the appearance of little irregular pieces of coral. These nodules are most abundant in the colon and rectum, but in a bad case are found scattered throughout the whole length of the intestines from the stomachs onward. We have never found the nodules in the walls of the stomachs themselves. The mesentery, liver, spleen and kidneys may occasionaly carry a few nodules, and the parasites have on one or two occasions been found to have perforated through the diaphragm and embedded themselves in the bases of the lungs. Beyond the presence of the nodules no changes are found except a general deficiency in fat throughout the body. When the disease has produced death this is almost always the consequence of the debility resulting from impaired intestinal functions. Rarely, a fatal "perforation" of the intestine owing to the sloughing of one of the nodules has been found to have occurred, although why this accident is not more frequent is not apparent. Sheep which have died of other diseases often show a greater or less number of these nodules in the intestinal walls.

If the fine skin (peritoneum) which covers one of the small tumours be cut through the nodule can generally be squeezed out, and has then the appearance of a small lump of greenish-yellow, cheesy material; in the middle of the cheesy mass will be found one or more little, rounded lumps of a substance which is so hard that it turns the edge of the knife with which one tries to cut it.

If a cross-section of the intestine be made at a place where one of the nodules is situated it will be found that the tumour is situated immediately beneath the serous coat (or outer skin) of the gut, and that *the mucous lining of the intestine is not affected*. This sub-serous position of the embedded parasite appears to be an invariable rule.

Sections of a well-formed nodule examined microscopically show that the tumour possesses *no cyst wall*. The outer cheesy material is found to consist of small cells apparently of inflammatory origin, and showing a tendency to change into fibrous tissue. The hard, round lumps in the centre of the tumour are, after decalcification, somewhat translucent, of a light brown colour and without structure. The knife of the section-cutter is apt to break up this material into irregular prisms, showing that, although decalcified, the substance remains very hard and brittle.

It is only in the earliest formed nodules that the outline of the worm can be detected; in the older nodules its structure is entirely lost, and the central horny lumps are all that is left of the body of the dead parasite. It is probable that the skin of the worm becomes transformed directly into the horny material.

If the neighbourhood of a recently-formed nodule be examined with a hand lens the track or tracks made by the worm as it burrows to its place of death can usually be detected as a sinuous line, or lines, of minute, black granules.

A chemical examination of the horny substances found at the centre

of the tumours shows that it is composed partly of the carbonates of lime and magnesia, but principally of an animal substance allied to chitin. The mode of origin of this substance, as well as its chemical composition, closely resembles that of the pearls occasionally found in the bodies of oysters and other shell fish. There can be no doubt but that these lumps of calcified chitinous material are, like pearls, the remains of the body or bodies of parasites which have probably died when in a larval state. The fact that these larvæ are all dead is a suggestion that they have burrowed into the tissues of a wrong host.

The adult parasites can usually be found with ease within the large intestine, and are most abundantly present in the cæcum. It is a white, slender worm measuring from $\frac{1}{2}$ to $\frac{7}{10}$ of an inch in length (12 to 18 mm.), the female being slightly longer than the male. The eggs are oval, and measure about $\frac{1}{285}$ of an inch in length (90 by 50 μ). The parasite is known as the *Œsophagostoma columbianum*.

The question of the treatment of the affected animal is one which is, at the outset, discouraging, owing to the fact that nothing can remove the nodules from the intestinal walls. Seeing that there are usually many adult parasites living free in the intestine, the use of vermifuge drugs would have the advantage of reducing the possibilities of further infection of the host and of other animals. For this purpose a drench containing 20 drops of creolin given daily for ten days has proved of some value, but must be combined with a change of pasture and a plentiful supply of salt. It is of no practical use to treat single members of a flock; the whole flock must be treated at the same time.

Of greater importance than the treatment of the sick animals is attention to the pasture which has been infected by their dung, for if this remain in use every sound sheep brought on to it will run the risk of being infected with the disease. The infected pasture may be abandoned altogether for one or more seasons, or turned over to other stock for a year or so before being again grazed by sheep.

The judicious marketing of such sheep as begin to show loss of condition will, if steadily carried out, prove of great assistance in obtaining a flock free from the disease.

It is probable that the eradication of the malady from a naturally damp locality would prove especially difficult, but should be attempted by clearing it of all sheep for a year, and then taking care that none but sound animals are brought back onto it.

Although sheep which have the disease but slightly are not unfit for the butcher, yet the damage done to the outer coat of the intestine renders this quite unfit for use as "sausage casings." In a badly infected pasture the loss of lambs and the extreme poorness of the flesh in adult animals is a serious economical consideration for the farmer.

[In the original report there are six excellent photographs from actual specimens, illustrating the parasites and the lesions produced.—Ed. *V.J.*]

ON SKULLS OF HORSES FROM THE ROMAN FORT AT NEWSTEAD, NEAR MELROSE, WITH OBSERVATIONS ON THE ORIGIN OF DOMESTIC HORSES.*

BY J. C. EWART, M.D., F.R.S.

In this very interesting contribution a description is given of the equine remains found by excavation at Newstead Fort, near Melrose, the site of a Roman settlement. The remains consisted for the most part of some twenty-four skulls, and the depths at which they were found, and their associations, were such as to lead to the conclusion that probably they belonged to horses used for cavalry and other purposes by Roman auxiliaries during the first and second centuries (A.D.). On comparative study of these skulls Professor Ewart classifies them into three types: (1) with a very narrow face; (2) with a short, broad face; (3) with a very long arched face, forming a distinct angle with the cranium. To estimate the size of the horses to which they belonged he compares them with modern types of horses presenting a similar conformation of the skull. Thus the third type resembles the skull of the *equus prejvalski* of the Great Gobi Desert (Steppe variety), the only wild horse now living; the first type the skulls of Celtic ponies and certain high caste Arabs; and the second type the skulls of horses of the forest variety met with in northern Europe and northern and western Asia. It was found necessary to make this comparison because the skulls in the various modern types show a marked difference in proportion to the height. In the wild horse of the Gobi Desert the height at the withers is slightly less than 2·4 times the length of head; in ponies of the Celtic type which are not dwarfed the height is 2·5 times the length of head; in well-bred Arabs, 2·6 to 2·7 times; in horses of the forest type, 2·7 times; and in dwarf varieties, 2·3 times. The length of skull is obtained by measuring from the occipital crest to the alveolar edge of the premaxilla over the central incisor teeth. From that comparison it was concluded that the horses to which the skulls in the fort belonged varied from 12 to 15 hands. In measuring the skulls of living animals a margin of error was certain to arise because of the varying amount of tissue covering the occipital crest and premaxilla, but probably it was so little that it may be neglected altogether. Of the second type there were three specimens among the collection from Newstead fort, and Professor Ewart thinks that they are the skulls of horses built on the lines of Highland ponies used for deer stalking. In the third type it is to be noted that the long axis of the basi cranium forms a very distinct angle with the long axis of the palate, that the long axis of the face is bent downwards, and it is thought, judging from the changes occurring during the development of the skulls in the Steppe variety, that these animals are derived from the forest type and have given up life among the forest and marshes for the open plains and uplands, where the grazing is shorter, and on account of which the cranio-facial angle has been developed. Moreover, the skulls are convex along this anterior surface from occipital crest to the nasal peak, due to the great size of the nasal chambers and frontal sinuses, indicating from the evidence of the Kiang a special adaptation for a life in cold mountainous areas. One of the skulls of the Plateau type resembles that of a 12-hands Celtic

* *Transactions of the Royal Society of Edinburgh.*, vol. xlv., part iii., No. 20.

pony in size and outline. Two of the smaller skulls of the first type probably belonged to horses with a small narrow face, a short strong back, and well-formed hind quarters, having the tail on a line with the croup, the limbs constructed for speed, with small joints, long fetlocks and rounded hoofs. Four of the long narrow skulls might well have belonged to Arab-like steeds about 13·3 to 14·1 high. Many of the skulls showed resemblance to two or more of the types which Professor Ewart distinguished, and the probable explanation is that these skulls belonged to cross-bred animals.

With regard to the source from which these animals were drawn, after careful consideration the author concludes "that the long-headed horses of the Steppe type came from either Germany or Spain; that the broad-headed horses of the forest type had in all probability come from the low countries; that the narrow-headed horses of the Arab type might have come from Spain or the south of France; and the majority of the cross-bred animals came from the north of France."

In considering the origin of domestic horses from the evidence afforded by these remains, Professor Ewart believes that during the first century A.D., there existed at least three types of horses, classified in the collection by the character of the skulls. Two of these are recognised by Professor Ridgway, viz., the Steppe variety and the Celtic or Libyan variety. Probably all the present-day breeds having the long face bent on the cranium have sprung from ancestors of the Steppe variety, *e.g.*, Shires, Clydesdales, Hackney, Dongola, Kattiawars, and several Arabs, Barbs and Irish hunters. In Shires a slight admixture of the forest type has occurred, but this is much more marked in the Clydesdale. Horses practically identical with the modern Shire breed, except in point of size, were in the Newstead fort. Evidence of Celtic blood sometimes appears in the Clydesdale, such as full eyes, small ears, perfect tail lock and very small hind chestnut. The Kattiawar breed of India is mainly derived from the Steppe and Forest varieties. In Irish hunters the skulls are often convex in front and the face is bent on the cranium, indicating that these horses are probably descended from the Steppe types, and originally introduced from Spain, and this probably accounts for the indomitable courage of these animals. The majority of small horses consist of a blend of the Plateau and Forest varieties. The English thoroughbred is probably derived chiefly from the Plateau type, but it frequently contains Steppe blood.

The above is a very short outline of the contents of this contribution. The work has been carefully done, and it is a very valuable addition to our knowledge of the derivation of the present day breeds of horses. It should prove of very special interest to veterinarians, and is well worthy of a diligent perusal.

J. F. C.

OPSONINS.

In the world of medicine, even as in that of dress, fashion is a factor that bulks largely. Years ago the barber-surgeon, acting with the best of intentions in his endeavours to cure human sickness, abstracted large quantities of blood from all and sundry. More recently

synthetic products from the chemist's laboratory, with polysyllabic titles and extraordinary potentialities—according to their inventors—formed the equipment of the up-to-date physician. And now, to-day, we follow the principle of setting a thief to catch a thief, and impress the services of bacteria themselves to aid in our fight against bacterial infections, and bacteriological therapy is undoubtedly *the fashion*. It must not be imagined, however, that we deprecate the intrusion of fashion into the realms of treatment. Far from it.

Experiment is the final test of the value of any and every remedial agent, and inasmuch as fashion, abetted by the general public, decrees that every new remedy shall be extensively exhibited in a variety of pathological conditions—apparently unsuitable as well as suitable—we are enabled in a comparatively short time to winnow the wheat from the chaff, and arrive at a just estimate of its utility and merit. In no instance has the truth of this statement been better exemplified than in connection with the bacterial vaccine elaborated by Professor Koch for the treatment of tuberculosis.

The original tuberculin prepared from *B. tuberculosis* derived from human sources made its appearance nearly twenty years ago, was pounced upon by the medical profession and extensively tested in the treatment of all forms of tuberculosis, with the result that within five years its use was almost entirely confined to the practice of the veterinary surgeon, who found in it a valuable diagnostic agent.

Then Professor Koch prepared his new "T.R.," or "tuberculin ruckstand," likewise made from a human strain of *B. tuberculosis*, which in its turn was largely administered, and, in most instances, strictly in accordance with "the directions on the bottle," and without a due appreciation of the fact that the human economy differs in many details from that of the guinea pig. T.R. was tried in the balance of professional opinion, and as, unfortunately, that balance had not been adjusted immediately prior to the weighing, was found wanting. Within the last few years, however, Wright has published the results of his study of certain substances in the blood serum to which he has given the name of Opsonins, and the trimming of the scales effected by these researches has so readjusted the balance that the sterling worth of Koch's New Tuberculin is now demonstrated, and it has once more become the fashion to treat tuberculous patients with tuberculin—or, as is frequently said, "by the opsonic method"—to the immense advantage of the patient.

The study of opsonins, in addition to opening up new fields for both speculative and experimental enquiry, has provided medical literature with a set of entirely new words and new phrases, some of which are so apt that they have already become popular colloquialisms; while the working hypothesis upon which the treatment of bacterial vaccines is based provides a novel and adaptable system of pathology sufficiently elastic to afford a ready explanation of the clinical aspects of each case from beginning to end. First, to state the experimental data upon which the superstructure of theory is raised.

Phagocytosis.

It has long been a matter of common knowledge that certain leucocytes of the polymorphonuclear type have the power of ingesting and destroying bacteria which have gained access to the body; more

recently Wright has shown that phagocytosis is not due to any vital activity of the leucocyte itself, but to some inherent property of the blood plasma assumed to result from the presence therein of certain substances, "opsonins," which by a process akin to narcotisation prepare the bacteria for absorption by the phagocytes.

This point can be demonstrated by first washing some white blood cells absolutely free from plasma, dividing them into two portions, then mixing one half with serum from a normal individual and the other half with normal saline solution. When these two preparations are respectively brought into contact with similar quantities of emulsion of tubercle bacilli, it will be found that phagocytosis is actively proceeding in the first preparation, and that it is, to all intents and purposes, absent from the second. Phagocytes are present in each, therefore the absence of phagocytosis from the second must be due to the absence from the saline solution of some factor which is present in normal blood plasma, viz., tubercle opsonin.

Opsonin *v.* Leucocyte.

Again, the phagocytes in normal blood, and in blood from a tuberculous patient, respectively, may, under ordinary conditions, have a vastly different power of dealing with tubercle bacilli; and if leucocytes from a different source are washed free from plasma and mixed separately, but under similar quantitative conditions, with the sera obtained from the normal and pathological blood respectively, before being brought into contact with the tubercle emulsion, precisely the same difference will be observed. But, on the other hand, when the washed leucocytes from these two different bloods are mixed with equal quantities of serum from the same source, no matter whether that source is normal or pathological blood, their phagocytic power is identical. Thus by different roads we arrive at the same point, viz., that the degree of phagocytosis depends upon some constituent of the serum and not upon the leucocytes themselves.

In the above experiments we have only taken cognisance of that particular constituent of the serum which prepares tubercle bacilli for ingestion by the phagocytes, "tubercle opsonin," but the theory provides for the presence in the serum of a separate and specific opsonin for practically every species of pathogenetic organism, and the existence of multiple opsonins can be shown in this manner. First, mix definite quantities of blood serum and emulsion of tubercle bacilli and allow them to remain in contact at the body temperature for some considerable time, then centrifugalise the mixture thoroughly in order to separate all the bacilli from the serum in the form of a deposit, and remove the clear serum. If a portion of this serum be mixed with "washed" leucocytes and a fresh portion of tubercle emulsion no phagocytosis will take place, showing that all the tubercle opsonin has been removed; but if a further portion of this same serum is mixed with washed leucocytes and an emulsion of, for example, staphylococcus pyogenes aureus, phagocytosis of the staphylococci will be observed, thereby denoting the existence of a second opsonin—staphylococcus aureus opsonin—and so on.

Opsonic Index.

The term "opsonic index," which is of constant occurrence in connection with these and similar observations, may be defined as that figure which compares the quantity of opsonin present in the serum

referred to with the amount of the same opsonin contained in normal blood, which latter is, for the purpose of calculation, regarded as unity. It is estimated experimentally by mixing suitable volumes of washed human leucocytes—usually obtained from a healthy individual—the serum to be tested and an emulsion of bacteria, maintaining the mixture at body temperature for fifteen minutes, then preparing a "blood film" from the mixture, staining, and ascertaining, with the help of the microscope, the number of bacteria ingested by one hundred consecutive polymorphonuclear leucocytes. This figure becomes the numerator of a fraction in which the denominator is formed by the number obtained from a single mixture containing normal blood serum in place of the serum for which the opsonic index is required. The greater the amount of opsonin present in a serum, the larger the number of bacteria that will be ingested by the leucocytes.

Returning once more to the tuberculous patient, as affording a text for our remarks, it is generally found that the index of the tubercle opsonin of his serum, as compared with that of the normal person's serum, is usually distinctly below unity, but may sometimes be markedly above unity, indices of 0·5 or of 1·4 being frequently met with.

For example, the total number of bacilli taken up by the first hundred phagocytes encountered in a mixture of washed corpuscles, emulsion of tubercle bacilli, and serum from a tuberculous patient, is found to be, say, 120. In a comparable mixture containing, however, normal serum, when tested under identical conditions, the first hundred phagocytes are found to have taken up 250 bacilli; consequently the opsonic index of the serum from the tuberculous patient—*so far as concerns tubercle opsonin*—is $\frac{120}{250}$—0·48.

On the other hand, when the sera from a number of healthy persons are contrasted with a "pooled" serum, made up of equal quantities of the serum from each of those comprising the series, the opsonic index, *quâ* tubercle, is found to be a much more stable quantity, and although variations from unity are noted, none of the indices are above 1·2 nor below 0·80, while nearly 90 per cent. of the sera will be found to yield an index situated somewhere between 0·9 and 1·1.

The next point for consideration is the reason for this marked variation from unity exhibited by the opsonic index of the tuberculous patient. The explanation of the phenomenon is simple, and although originally deduced from the sequence of events occurring in the experimental animal inoculated with a pathogenetic bacterium, can quite readily be followed by observing the movements of the opsonic index in a tuberculous patient under treatment by Koch's Tuberculin "R."

Immediately following the introduction of a therapeutic dose of "T.R." into the subcutaneous tissue of a patient suffering from localised tuberculosis, a latent period supervenes, and lasts for from twenty-four hours to fourteen days or more—varying with the patient, size of the dose, &c. During this period, which is designated "the negative phase," the opsonic index for tubercle falls below its original level, probably because the already small amount of tubercle opsonin in the serum is used up in the attempt to secure the destruction of the inoculum—the solution or suspension of bacterial protoplasm of which the tuberculin consists. During this period the patient is undoubtedly less resistant to tubercle infection, and although no appreciable rise of

temperature is induced (unless the dose is excessive), the patient generally notes that he or she feels less well than previously to the injection.

As the result, however, of the stimulus provided by the introduction of the tuberculin, fresh supplies of tubercle opsonin are elaborated and poured out into the serum, so that the latent period or negative phase is succeeded by a "positive phase," during which the opsonic index rises, slowly or rapidly, to a maximum, and a subjective sense of improvement is remarked.

After the maximum is reached, the index not infrequently exhibits a slight fall, or one or two slight oscillations, after which a condition of equilibrium is established in which the index is maintained at a distinctly higher level than it occupied before the injection, although even now the index is not necessarily above or at the normal. This state of equilibrium is not, however, permanent, and after a period, varying with the different patients, tails off gradually or rapidly until it has fallen to or even below the position it occupied previously to the injection. A repetition of the injection towards the end of the stage of equilibrium provokes a repetition, in their entirety, of the phenomena already detailed, and the repeated introduction of doses of tuberculin are requisite to ensure the removal of the tuberculous lesion.

Such is the normal course of events If, however, a second dose of tuberculin is injected during the negative phase provoked by the first, a cumulative action is noted, a second negative phase is superposed on the first, and the opsonic index may be almost or even entirely abolished, with disastrous effects to the patient. On the other hand, there is no evidence of cumulation of positive phase; a second inoculation administered during the positive phase of a previous injection may result in the production of a shorter or less marked negative phase, but for all practical purposes that is the net result.

Auto-Inoculation.

If the opsonic index of the untreated tuberculous subject be observed over a period of some weeks, similar movements will be noted. These are due to the alterations in the amount of tubercle opsonin present in the serum, which result in the removal, from time to time, either of living tubercle bacilli or of the products of the metabolism of the tubercle bacillus from the focus of infection. Such an occurrence is spoken of as autoinoculation, and is followed by the same set of phenomena as is observed after the injection of a dose of tuberculin. Consequently, if a specimen of blood is abstracted during the negative phase, the patient's serum gives a low index; if at or near the maximum of the positive phase, a high index. Operative procedures, dressings, manipulation, and even muscular exertion, also appear to act as inoculations, and are followed by similar phenomena. Dame Nature appears to endeavour to cure her patients through the agency of auto-inoculation; usually, however, she is too hasty in repeating her doses, and too prodigal as to the quantity of therapeutic agent she administers; but if the autoinoculations occur at suitable intervals, and the number of bacilli set free is not excessive, a permanent increase in the amount of tubercle opsonin available is established, and a natural cure results.

(*Journal of Clinical Research.*)

HUMAN AND BOVINE TUBERCULOSIS—WITH REFERENCE TO TREATMENT BY SPECIAL KINDS OF TUBERCULIN.

NATHAN RAW, M.D., M.R.C.P.LOND., F.R.S.EDIN., PHYSICIAN MILL ROAD INFIRMARY, LIVERPOOL.

THE treatment of phthisis pulmonalis and other forms of tuberculosis is of such intense urgency and importance, that any method based on scientific investigation ought to be thoroughly tested, with a view to diminishing the awful mortality in this country from tuberculosis.

I have been greatly disappointed in the treatment of phthisis by Koch's Tuberculin R., but in the treatment of surgical tuberculosis, such as tubercular peritonitis, meningitis, bone and joint disease, enlarged glands and lupus, the results with Tuberculin R. (Koch) have been most excellent, and I have at present a great many cases under treatment in hospital by this tuberculin as supplied by the Clinical Research Association. I have recently had prepared from my own cultures of bovine tubercle, a tuberculin for use in phthisis pulmonalis, with, so far, encouraging results. A perusal of my paper in the April, 1907, number of "Tuberculosis," will explain the reason why tuberculin from bovine sources should be used for phthisis, whilst Koch's Tuberculin R., which is prepared from human tubercle bacilli, should be used for the other forms of tuberculosis.

During the last ten years I have had under observation over 4,000 cases of phthisis pulmonalis, and over 1,500 cases of what are called surgical tuberculosis. In addition to having had the opportunity of observing this large number of cases in the wards of a hospital, I have made over 800 *post-mortem* examinations on tubercular cases, the great majority of which were very carefully and minutely examined. In addition to this hospital work, for the last four years I have been conducting a special research into the distribution of tuberculosis in Liverpool, and have made a large number of experimental and other observations in the Pathological Department of the University of Liverpool.

The general results and impressions of that work are given here, but in the limited space at my disposal it is impossible to do more than touch generally on a few of the more important points investigated during this research. Following the lines of my original paper of 1903, I have no reason to modify the view then set forth, namely—"That human and bovine bacilli are divisible into two distinct types of a common species—(1) Typus humanus; (2) Typus bovinus."

Another fact of the most profound importance in studying this problem is that for centuries man has been accustomed to feed upon cattle and their products—milk, butter, cheese, &c., and in this way the human body has become tolerant to bovine tubercle bacilli.

Whilst I firmly believe that human and bovine bacilli are different types of parasites, yet I am convinced that bovine bacilli are freely communicable to humans, and are the cause of a large amount of tuberculosis in children. I believe that man is attacked by two distinct varieties of tubercle, one conveyed by infection from one person to another, the other by receiving into the body bovine bacilli from infected food. In other words, the human body is susceptible to both forms of tubercle.

The difficult problem to determine now is what particular lesions in the human body are produced by each variety of tubercle. To sum up my own views on the distribution of tubercle in the human body, I would say, speaking provisionally, and without any final evidence of proof, that—(1) Tubercle bacilli of the Typus humanus produce phthisis pulmonalis, ulceration of intestines and abdominal glands; (2) Tubercle bacilli of the Typus bovinus produce tubercular peritonitis, tuberculosis of the lymphatic glands, tubercular meningitis (probably) and lupus.

I am of opinion, also, that acute miliary tuberculosis is of bovine origin. Working on the hypothesis that the human body is attacked by two varieties of tubercle which may be present in the body at the same time, and which, generally speaking, are antagonistic to each other, I have devoted my attention within the last few months to the preparation of tuberculins for the treatment of these different lesions. After a fairly complete experience, I have come to the conclusion that Koch's Tuberculin R. has little or no healing effect in phthisis pulmonalis, and when we remember that it is manufactured from human tubercle, if my theory is correct it is exactly what we would expect. Consequently I have had prepared from one of my own pure cultures from bovine sources, a special tuberculin for the treatment of phthisis pulmonalis. The tuberculin was made from a typical culture from "perlsucht," and was very carefully sterilised and standardised. Several guinea-pigs were inoculated, but without any bad effect.

Working on these lines, I am at present treating over seventy cases of surgical or bovine tuberculosis in the wards of this infirmary with Koch's Tuberculin R., commencing with very small doses and slowly increasing up to a maximum dose of one milligramme. The results, without any accessory treatment, have been beyond all my anticipation. Enlarged glands, joints, and lupus have been immensely improved, whilst discharging sinuses have cleared up, and in one case the symptoms of tubercular meningitis, associated with tubercular peritonitis, entirely disappeared. The full results of this large number of cases treated by tuberculin will be published in due course. On the other hand, I have treated six cases of early phthisis pulmonalis, four of which were associated with hæmoptysis, and all of which showed tubercle bacilli in the sputum with distinctive physical signs at one apex, with the tuberculin prepared from a pure culture of bovine tubercle (kindly supplied to me by Professor Calmette, of Lille). These cases are still under treatment, but up to the present all of them have shown marked improvement, with total disappearance of physical signs. It is too soon yet to speak of the final results of treatment, but I hope to publish them after one year.

My tuberculin should only be used in early cases, and, if possible, in conjunction with open-air or sanatorium treatment. The directions and dosage issued by the Clinical Research Association should be strictly adhered to if good results are to be obtained. With a view to producing immunity against human tubercle in children, especially in those who have been exposed to infection from a consumptive father or mother, I have lately been working with the serum of tuberculous cattle. I have purchased several dairy cows suffering from tuberculosis of the udder, and have obtained, with the kind co-operation of Professor Annett, a large amount of the serum of these cows. This serum has

been very carefully sterilised and injected into guinea-pigs without any ill-effects. I believe that the serum of a cow which has suffered from bovine tuberculosis will confer such immunity when injected into a child as will suffice to protect it against an attack of human tuberculosis.

Considering the large number of children who are attacked by phthisis pulmonalis as the direct result of contact with a consumptive parent, a protective serum would be an immense step in the direction of stamping out consumption. In any case the serum is quite harmless and will only be used with the full consent of those parents whose children have been exposed to infection.

Conclusions.

(1) Human and bovine *B. tuberculosis* are different varieties of a common species.

(2) The human body is susceptible to infection by both forms.

(3) Bovine tuberculosis is frequently conveyed to humans, both by means of infected food and by contagion.

(4) These two forms of tubercle are antagonistic to each other.

(5) A mild attack of bovine tuberculosis protects against phthisis pulmonalis.

(6) Tuberculin from human sources has a marked curative effect on bovine lesions.

(7) Tuberculin from bovine sources may have a curative effect on phthisis pulmonalis.

(*Journal of Clinical Research.*)

AN OUTBREAK OF SOUTH AFRICAN HORSE SICKNESS IN SOUTHERN ARABIA.*

BY CAPTAIN A. C. INGRAM, INDIAN MEDICAL SERVICE.

In the autumn of 1906 an epidemic disease of equines appeared suddenly in the Aden Hinterland and gradually spread down to Aden. This disease proved to be South African horse sickness.

The outbreak was first observed among some transport mules at D'thala, which is situated about 70 miles due north of Aden. On September 10 a mule, while at work, suddenly fell ill and died within a few hours, "frothing" at the nostrils after death. A second mule died on September 14 in an exactly similar manner. Between September 10 and November 7, sixteen mules died, or were shot when their condition appeared to be absolutely hopeless; nineteen mules were sick of the disease, of which eight appeared to be recovered. On September 28 the ponies of the Aden Troop in D'thala were attacked, and up to November 7 ten died, or were shot *in extremis;* six appeared to be recovered and five were sick. In addition, three officers' ponies were shot *in extremis* and one was sick on November 7. One Conductor's pony appeared to be recovering. A pony belonging to the food contractor had died, and two out of four ponies belonging to the Amir of D'thala had died. I saw almost all these animals myself, and

* Abstracted from the *Journal of the Royal Army Medical Corps*, June, 1907.

performed, or was present at, nine *post-mortem* examinations. All presented the lesions of South African horse sickness.

The Arabs in the vicinity of D'thala gave very conflicting accounts; but it appears to be fairly certain that about seven to ten days before the outbreak of the disease at D'thala, two horses and one mule died suddenly of a very similar disease at a place on the Turkish border about 10 miles from D'thala. It seems probable, therefore, that the infection came to D'thala from the north by way of Turkish Arabia.

At about the end of October this disease appeared at Lakej, which is situated about half way between D'thala and Aden. It is impossible to state the exact date of the outbreak at Lakej. On October 20 Major Smith, D.S.O., A.V.C., passed through Lakej and reported that no horses were sick in that place. On November 9 the Sultan of Lakej wrote that "thirty-eight horses had died within the last few days." On November 29 an Indian *salutry* visited Lakej and reported that ten horses in the Sultan's stables were sick, and that about fifty horses had died in the Lakej district.

Somewhere about the end of October the disease appeared in Shaikh Othman, 9 miles from Aden. In October three horses died in this place, but the cause of their death was not accurately ascertained. From November 1 to December 7, nineteen horses died in Shaikh Othman, and one horse was then sick.

In Khormaksar, about 3 miles from Shaikh Othman, one horse died in October and four in November.

In the Crater, Aden, five horses died in October; from November 1 to December 7 ten horses died, two were shot *in extremis*, and two remained sick. I saw several of the sick animals in the Crater, and one *post-mortem* examination; they presented exactly the same conditions as were present in the diseased animals at D'thala.

By the kindness of Colonel Bruce, R.A.M.C., I was enabled to compare Dr. Watkins-Pitchford's description of the morbid anatomy of this disease as observed in Natal. I found all the morbid conditions described by Dr. Watkins-Pitchford, save the changes in the marrow of the femur, which I was unable to see, owing to lack of instruments. The blood of some of the diseased animals was examined microscopically by Major Smith, the Parel Laboratory, Bombay, and myself, with negative results in every case. Cultures and inoculation into a mouse and a guinea-pig, with some blood obtained by me from diseased animals, were made at the Parel Laboratory, Bombay, with negative results. Major Smith had previously seen this disease in South Africa and had no hesitation in identifying it. The acute pulmonary form of the disease was relatively infrequent, but I was able to obtain a photograph of a mule after death showing the characteristic froth at the nostrils. This photograph is similar to the one reproduced in the *Journal of the Royal Army Medical Corps*, vol. vii., September, 1906, p. 241.

A considerable amount of evidence has been brought forward to show that this disease is probably carried by Anopheles mosquitoes. It is curious that this disease appeared in D'thala at the height of the mosquito and fever season, and commenced in Shaikh Othman and Khormaksar shortly after the beginning of the mosquito and fever season in these places. In D'thala Anopheles mosquitoes appeared on August 5, 1906, and increased steadily in numbers up to the end of

September, gradually diminishing in numbers after that date, until, when I left D'thala on November 7, only one or two Anopheles could be found. In Shaikh Othman and Khormaksar Anopheles usually appear in October (Captain W. S. Patton, I.M.S), and when I arrived at Shaikh Othman on November 24, Anopheles mosquitoes abounded there. If the infection be conveyed by an Anopheles mosquito it must be carried by the *Anopheles arabiensis* (Patton), since this is the only species which is numerous in all the places where the disease appeared. Unfortunately an experiment of isolating two mules in mosquito netting proved abortive, owing to lack of supervision.

I had some difficulty at first in understanding how the disease was conveyed from D'thala to Lakej, as the Arabs possess extremely few horses and mules, and none were permitted to leave D'thala. However, I found that a couple of donkeys died near D'thala during October, and it is known that donkeys can suffer from South African horse sickness in a mild form. Now donkeys are very common beasts of burden in this part of Arabia, and were continually going from D'thala to Lakej and Shaikh Othman. I think, therefore, that the infection was probably carried by donkeys from D'thala to Lakej and Shaikh Othman.

In conclusion, I wish to thank A. S. Meek, Esq., Transport Officer at D'thala, Major Jacob, Political Agent at D'thala, and Captain Hancock, first Assistant Resident at Aden, for the information they kindly placed at my disposal.

ROYAL COLLEGE OF VETERINARY SURGEONS.

Examinations in London.

The following passed their final examination and were admitted membersof the Royal College of Veterinary Surgeons:—

Mr. H. Allen
,, H. Brassey-Edwards
,, A. H. Bowhay
,, P. L. Edward
,, F. B. Greer
*,, H. T. Hughes
,, W. Holliday
,, E. Hutchins
,, M. H. Kingcome
Mr. F. M. Kelly
,, G. W. Lucking
,, P. S. Morgan
,, V. McLeish
,, J. W. O'Kelly
,, H. Tay
,, W. Waters
,, P. Stanley

Passed the third examination:—

Mr. A. Akin-Higgins
,, W. H. Andrews
,, W. E. Blackwell
,, D. Evans
,, W. E. Footner
*,, H. Gooch
,, G. D. Godwin
,, W. D. Halfhead
*,, G. E. Henson
,, M. C. Matthews
,, J. Martin
*Mr. E. Measures
*,, E. McK. Nicholl
,, J. C. S. Powell
,, E. S. Pindar
†,, F. M. Reynolds
*,, T. B. Somerville
*,, A. W. Shilston
,, J. H. V. Treseder
,, W. B. Towell
,, E. G. Turner
,, S. B. Vine

Passed the second examination :—

*Mr. E. J. Barrowcliffe
,, A. A. Comerford
,, D. H. Dimes
,, A. B. Fewings
* ,, A. E. Froggatt
,, V. Franklin
,, R. E. Lloyd
,, E. C. Lloyd
,, N. F. Richardson
,, R. H. Smythe
,, O. Stinson
Mr. J. G. Smith
,, G. B. Slinn
,, R. C. G. Thwaytes
,, L. Thompson
,, F. A. Le Poer Trench
,, G. Wacher
,, H. S. Woods
,, T. S. Young
,, B. S. M. Cope
,, W. Sewell

Passed the first examination :—

Mr. D'Arcy S. Beck
,, J. McK. Brown
,, D. A. E. Cabot
,, F. L. Eady
† ,, B. Gorton
,, J. C. Gaunt
,, T. Herratt
Mr. R. E. Leach
,, B A. Myhill
,, G. A. Robert
,, W. K. Stephens
,, H. D. Sparrow
* ,, T. W. W. Wright

* Passed with 2nd Class Honours.
† Passed with 1st Class Honours.

Examinations in Liverpool.

The following passed their final examination :—

Mr. J. Rigby
Mr. Greenway

Passed the third examination :—

*Mr. E. J. Burndred
,, R. P. Jones
Mr. W. Simister
,, W. S. Walker

Passed the second examination :—

Mr. J. T. C. Bradshaw
,, J. A. Griffiths
,, R. J. Little
Mr. C. F. Shawcross
,, H. L. Sowerby

Passed the first examination :—

Mr. W. Andrew
* ,, J. R. Barker
,, W. A. Dykins
,, S. Kirby Jones
* ,, C. W. Makinson
Mr. F. G. Norbury
,, W. Oldershaw
* ,, H. Quigin
,, W. Taylor
,, C. Wadsworth

* Passed with 2nd Class Honours.

Examinations in Dublin.

The following passed the final examination :—

Mr. T. J. Alexander
,, A. E. Anderson
,, C. M. Griffin
,, W. J. Moran
Mr. Alec. Monro
,, T. Russell
*† ,, R. J. Stirling

* Award Medal of the Veterinary Medical Association of Ireland for the best final Examination for the Diploma.
† Will not receive Diploma until October 15th (under age).

Passed third or Class C. Examination :—

Mr. D. Barry
,, J. Devlin
,, J. C. Doran
,, J. Doyle
,, E. C. Doyle
,, J. D. Ferguson
,, J. J. Hilliard
,, C. H. Lambert
,, J. McBirney
Mr. E. McSwiney
,, P. J. Malone
,, D. T. Mitchell
,, E. A. Murray
,, S. H. Power
,, J. C. Ryan
,, F. Smyth
,, J. Winckworth
,, J. Walsh

Passed second or Class B. Examination :—

Mr. C. Armstrong
,, M. Cahill
,, M. Cunningham
§ ,, J. Fox
‡ ,, H. Good
,, W. St. J. F. McCartney
‡Mr. B. Mellon
,, M. G. O'Connell
,, A. O'Dea
,, F. Shearman
,, H. Tabuteau-Herrick

Passed first or Class A. Examination :—

Mr. M. Brett
§ ,, C. M. Bryan
,, P. A. Carroll
§ ,, J. M. Crowe
,, W. Flannagan
,, M. J. Glynn
§ ,, F. Hayes
‡ ,, T. R. Hunt
,, G. A. Kelly
,, A. Kirkpatrick
,, E. Little
,, H. Lowry
§Mr. P. MacCormack
‡ ,, D. Meadows
§ ,, W. Nyham
,, T. O'Byrne
,, J. O'Grady
,, W. E. Phipps
,, W. Power
,, T. L. Shea
§ ,, F. J. Sheedy
,, J. Smith
,, W. P. Walsh
,, F. Weir

‡ Passed with 1st Class Honours.
§ Passed with 2nd Class Honours.

Personal.

On reporting his arrival at Lahore, Captain J. D. E. Holmes, I.C.V.D., was appointed to the position of Professor of Sanitary Science at the Punjab Veterinary College, succeeding Mr. S. H. Gaiger, I.C.V.D.

On being relieved by Captain J. D. E. Holmes of the duties of Professor of Sanitary Science, Mr. S. H. Gaiger was appointed to the Professorship of Surgery at the Punjab Veterinary College, succeeding Captain A. Smith, I.C.V.D.

Utrecht Veterinary School.—M. J. J. Wester, District Veterinary Surgeon of Alkmäar, has been appointed Professor in the Utrecht Veterinary School.

Buenos Ayres.—Professor Martinoli, of the Parma Veterinary School, has been appointed a Professor in the Buenos Ayres Veterinary School.

We regret to hear of the death of Professor Adolphe Reul at Brussels on January 13. Professor Reul was born at Braives, Belgium, on June 7, 1849, and graduated from the Cureghem School in 1871. He practised his profession at Mouland till March 20, 1873, when he was appointed Professor of Clinical Medicine at Cureghem, and shortly afterwards was transferred to the chair of zootechny and external anatomy. He was the author of numerous papers, his best known works being on "The Dog," "The Belgium Draught Dog," and "The Barbancon Horse." He was the original founder of "The Belgium Draught Horse Stud Book." He was universally respected, both as a practitioner and an individual.

Professor Giulio Valdonio, Professor of Zootechny in the Parma Veterinary School (Italy) died on January 30. He was born at Castelsangiovanni (Plaisance) on November 19, 1842, and served during the war of 1859 as a volunteer in the Italian Army. On the termination of the war he entered the Parma School, from which he graduated in 1868, and was appointed assistant Professor of Clinical Medicine in 1869. In 1870 he was appointed assistant at the School of Agriculture. In 1883 he was made extra Professor of Hygiene and Zootechny at the Parma School, and in 1880 Professor, which appointment he held till his death. He was the author of numerous papers and books, the best known of which is his "Traité de Zootechnie," published in 1875.

Reviews.

A Veterinary Pathological Anatomy, and Post-Mortem Examinations. By Professor C. Cadéac and V. Ball, Lyons Veterinary College. Volume I., 475 pages, 100 illustrations. Price, 5 francs. Published by Messrs. J. B. Baillière and Sons, 19, Rue Haute Feville, Paris.

The book, which has just been published, is the twenty-seventh volume of M. Cadéac's well-known "Encyclopédie Vétérinaire," and is divided into three sections:—

(1) Post-mortem examinations on solipedes, bovines, dogs, cats, and birds.

(2) Pathological anatomy, degeneration, alterations in the elementary reproductive function, altered nutrition, morbid processes, congestion, œdema, hæmorrhage, thrombosis, embolism, gangrene, inflammation, acute and chronic inflammatory neoformations, tumours, sarcoma, lymphadenoma, endothelioma, myxoma, glioma, fibroma, lipoma, chondroma, osteoma, myoma, angioma, neuroma, epithelioma, adenoma, papilloma, teratoid tumours, cysts.

(3) Treatment, prophylaxis, hygienic measures, asepsis, antisepsis, vaccination, therapeutics, treatment of causes, symptoms and lesions.

M. Cadéac's monumental work progresses regularly, and his pathological anatomy is quite up to the standard of the other volumes. The section on *post-mortem* examinations is particularly valuable, and as far as is possible the most systematic directions are given. As a rule autopsies on animals are conducted in a very slovenly manner.

The drawings showing how the various cavities of the heart should be opened are worthy of special notice.

The majority of the drawings are originals, prepared from specimens obtained from animals, not borrowed from works on human pathology, and the chapter on tumours is from the pen of M. Ball, who is an authority on this special subject.

The book is got up in the same style as the other volumes of the Encyclopædia, which is a guarantee for its get up. We can confidently recommend it to any veterinarian who can read French.

HORSES: THEIR POINTS AND MANAGEMENT IN HEALTH AND DISEASE. By F. T. Barton, M.R.C.V.S. Demy 4to., 363 pp., 57 illustrations. Published by Messrs. Everett and Co., London. Price 15s. net.

IN his preface the author of this work prepares us for an elementary treatise on the various breeds of horses, referring chiefly to their history, conformation, and defects, and the work for which they are suited, and he expresses the hope that it may be both useful and interesting. Bearing in mind that the work is "elementary," we think the author has fully achieved both his objects. The descriptions of the different breeds are given in generalities rather than in particular detail, if we except those excellent articles contributed by Mr. J. Jones, of Dinarth Hall, the great authority on Welsh ponies, and Colonel Henriques. We think the author would have been well advised had he gone into detail a little further, and given more measurements, such as those of the girth and of "bone" (*i.e.*, round the cannon immediately below the knee and hock), of well-known and of average specimens of each of the breeds. The weight might have been included with advantage also. We hope the author will see fit to make these additions in future editions. Such measurements have been given of the Suffolks and Clevelands.

The proofs must have been very carelessly read, as we find numerous mistakes which should have been corrected, such as "fomentative" for "fermentative changes" (p. 44); "The elastic plates of cartilage at the back and upper part of the hoof on a line with the coronary band may be calcified, otherwise, the horse have sidebone" (p. 93). (We leave it to our readers to make out what they can from that sentence.) "Bog-spavin" is said to be at the back of the hock (p. 173). On p. 208 in a genealogical circle, "Venture" foaled in 1823 is depicted as being by "Ebor," foaled in 1828.

When we come to the illustrations, which are chiefly from photographs, we have nothing but praise for them. They in themselves are of considerable educational value, enabling one to compare at a glance the points of perfect specimens of the different breeds. The diagram on p. 49, however, is carelessly numbered, there being no difference between numbers 19 and 20 (pastern and coronet), and the stifle is marked lower than the second thigh.

The last few chapters are devoted to an elementary description of some common diseases, with some hints as to treatment. The latter, however, need not trouble the veterinarian, as the treatment is chiefly in the form of "first aid," and should be useful to many horse-owners.

The work of the publishers is excellent.

COMMITTEE APPOINTED TO INVESTIGATE DISTEMPER IN DOGS.

THE President of the Board of Agriculture and Fisheries has appointed a committee to inquire into the nature of distemper in dogs in Great Britain, and to report whether any preventive or remedial measures, exclusive of ordinary medical treatment, can with advantage be taken with respect to it. The committee is constituted as follows: The Duke of Beaufort, Lord Middleton, Lord Leconfield, Sir John M'Fadyean, Mr. Edward Barclay, Mr. Stewart Stockman, and Mr. William Musgrave Wroughton. Lord Middleton is to be Chairman, and Mr. J. R. Jackson, M.R.C.V.S., Veterinary Inspector of the Board of Agriculture, is to act as Secretary. The expenses are not to be defrayed out of the public funds.

MOTOR OMNIBUS LOSSES—THREE COMPANIES LEAVE THE ROAD.

THREE motor omnibus companies have taken their vehicles off the London streets during the last week, and have determined to cease working until better times come. Together they operate 104 motor omnibuses.

According to the managers who were interviewed the cause of the failure is a combination of low fares and the police. Mr. W. E. Bracey-Wright, the manager of the London Power Omnibus Company, which withdrew sixty-seven omnibuses on Tuesday night, declares that the vexatious regulations of the police have made working at a profit impossible.

The second company which has ceased working is the Associated Omnibus Company, which was running thirty vehicles between Victoria and North London. Mr. P. Willing Tibbs, the managing director of this company, also blamed the police and low fares, and said that his company would soon resume.

The third company is the Victoria Omnibus Company, which had nine "Old Vic" omnibuses running between Victoria and Cricklewood. They were taken off the streets on Saturday.

[We are informed that over 200 motor omnibuses have just been taken off the London streets for various reasons.—ED. V. J.]

LONDON'S £6,000,000 LOSS.

IT was stated at a meeting of the Street Noise Abatement Committee on Saturday that the motor omnibus and traction engine traffic had, in the course of two years, depreciated the value of house property in London to the extent of fully £6,000,000. Every week, it was further stated, was adding thousands of pounds to the loss that was being incurred by property owners.

(*Daily Express.*)

RE-DISTRIBUTION OF OFFICERS OF ARMY VETERINARY CORPS IN INDIA ON THE ABOLITION OF COMMANDS.

Name.	Station.	Remarks.
Army Headquarters.		
Col. J. A. Nunn, C.B., C.I.E., D.S.O.	Simla	Permanent Veterinary Officer in India
Lieut.-Col. J. Moore	Simla	Deputy Permanent Veterinary Officer in India
First (Peshawar) Division.		
Capt. A. England	Peshawar	Senior Veterinary Officer.
Lieut. A. J. Thompson	Nowshera.	
Second (Rawal Pindi) Divisio		
Col. R. Pringle, D.S.O.	Murree	Senior Veterinary Officer.
Lieut. R. C. Matthews	Rawal Pindi.	
,, B. P. Argyle	Sialkot.	
,, A. S. Lawrie	Sialkot.	
,, B. H. Lane	Campbellpore.	
,, W. J. Dale	Rawal Pindi.	
Third (Lahore) Division and Frontier Brigades.		
Major W. D. Smith	Lahore	Senior Veterinary Officer.
,, W. R. Walker	Ambala	Army Veterinary School.
Lieut. L. M. Verney	Jullundur.	
,, H. C. Dibben	Ambala.	
,, F. W. H. Thomas	Multan.	
,, J. W. Rainey	Ambala.	
,, A. L. Horner	Ambala.	
Fourth (Quetta) Division.		
Capt. G. Conder	Quetta	Senior Veterinary Officer.
Lieut. W. A. Jolbert	Hyderabad (Sind).	
,, H. T. Ryan	Karachi.	
Fifth (Mhow) Division.		
Major H. J. Axe	Mhow	Senior Veterinary Officer.
Capt. P. V. Beatty	Jhansi.	
,, H. S. Mosley	Jubbulpore.	
Lieut. W. Ludgate	Saugor.	
,, D. Macdonald	Mhow.	
,, H. M. Williams	Neemuch.	
,, J. S. Nimmo	Jubbulpore.	
,, R. W. Mellard	Mhow.	
Sixth (Poona) Division.		
Lieut.-Col. Kay Lees	Poona	Senior Veterinary Officer.
Major E. E. Martin	Poona	Army Veterinary School.
Lieut. H. Allen	Poona.	
,, A. C. Anderson	Kirkee.	
,, J. R. Hodgkins	Kirkee.	
Seventh (Meerut) Division.		
Major F. W. Wilson	Meerut	Senior Veterinary Officer.
Lieut. F. Fail	Meerut.	
,, S. F. G. Pallin	Muttra.	
,, H. Greenfield	Meerut.	
,, F. C. O'Rorke	Bareilly.	
,, L. Danels	Muttra.	

Name.	Station.	Remarks.
Eighth (Lucknow) Division.		
Major H. T. Sawyer	Lucknow	Senior Veterinary Officer.
Capt. W. B. Edwards	Barrackpore.	
,, C. E. Steel	Lucknow.	
Lieut. J. R. Steevenson	Allahabad.	
,, W. H. Walker	Lucknow.	
Ninth (Secunderabad) Division.		
Lieut.-Col. C. E. Nuthall	Ootacamund ...	Senior Veterinary Officer.
Capt. R. F. St. C. Houston ...	Secunderabad.	
,, J. T. Jackson...	Bangalore.	
Lieut. H. E. Gibbs...	St. Thomas' Mount.	
,, T. A. Nicholas	Secunderabad.	
,, J. T. H. Hughes	Bangalore.	
,, A. Edgar	Bangalore.	
,, J. A. Bosley...	Secunderabad.	
,, W. H. Simpson	Bangalore.	
Tenth (Burma) Division.		
Capt. D. Bolton	Mandalay	Senior Veterinary Officer.

INTERNATIONAL CONGRESS FOR HYGIENE AND DEMOGRAPHY.

THE fourteeenth International Congress for Hygiene and Demography will take place in Berlin from September 23rd to the 29th, 1907.

Besides the Congress, exhibits in hygiene and means of life-saving will be arranged. The Congress has for its object the scientific and practical improvements of all hygienic and demographic endeavours. Every person, gentleman or lady, engaged scientifically or practically in hygiene or demography, may become a member of the Congress. But the Committee of Organisation is privileged to debar all such persons which may not be deemed suitable.

The fee for membership has been fixed at £1 (20 marks). Relatives of the members of Congress who are not capable of becoming members themselves, as well as frequenters of colleges or universities, may be admitted to the meetings and dispensations of the Congress on payment of 10s. (10 marks). But such persons are not entitled to take part in the discussions and have no claim to the printed matter. Each member will receive one copy of the printed reports and of the protocol appearing at the termination of the Congress, which ought not to exceed two volumes.

The Congress is divided into 8 sections:

Section I. Hygienic microbiology and parasitology.
,, II. Dietetic hygiene, hygienic physiology.
,, III. Hygiene of childhood and schools.
,, IV. Professional hygiene and care of the working classes.
,, V. Combating infectious diseases and care of the sick.
,, VI. A. Hygiene of dwellings, townships, and waters.
,, VI. B. Hygiene of traffic. Life-saving.
,, VII. Military, Colonial, and Naval hygiene.
,, VIII. Demography.

The sessions are divided into general and section sessions. The

opening and the closing meetings are general sessions. Furthermore, joint meetings of different sections may take place. The official languages during the Congress are German, French, and English.

The speakers are ranged according to the dates on which their written announcements were received at the General Office.

During the discussion each speaker is allowed five minutes.

A speaker desiring to discourse longer than five minutes must appeal to the section, which gives its decision.

No person may speak more than twice on the same topic. Anyone wishing to speak a third time must have the permission of the section.

At the termination of the discussion the reporters are allowed a short epilogue.

Announcements of lectures and demonstrations must be addressed to the President of the respective section, with a short summary enclosed. The President is to see that these lectures and demonstrations take place in turn of their announcement, inasmuch as the treaty of the official subjects is not interfered with.

While the Congress is in session a daily paper will appear, in which the order of the day, as settled upon by the Presidents of the respective sections, notices concerning excursions, sight-seeings, entertainments, &c., will be published.

In the final session the motion of the Permanent International Commission is acted upon, and the time and place of the next Congress appointed. During the session the Congress also decides as to whether the proposals made by the sections are to be accepted or rejected.

Committee for England.—Chairman: Sir Shirley F. Murphy, Medical Officer of Health, Administrative County of London, 9, Bentinck Terrace, Regent's Park, London, N.W. Hon. Secretary: (1) George H. F. Nuttall, M.D., Ph.D., Sc.D., F.R.S., Quick Professor of Biology, Reader in Hygiene, University of Cambridge; Chief Editor of the *Journal of Hygiene*, 3, Cranmer Road, Cambridge. Hon Secretary: (2) Paul F. Moline, M.B., Financial Secretary and Assistant Secretary, 7th International Congress of Hygiene and Demography, London, 1891, 42, Walton Street, Chelsea, London, S.W. Treasurer: Thomas W. Cutler, Esq., Fellow of the Royal Institute of British Architects, 5, Queen Square, Bloomsbury, London, W.C.

Programme.

SUNDAY, SEPTEMBER 22.

8 o'clock p.m.: Reception of Members of the Congress at the Neues Königliches Operntheater (Kroll).

MONDAY, SEPTEMBER 23.

11 o'clock a.m.: Meeting of inauguration at the Neues Königliches Operntheatre (Kroll).
Thereafter: Inauguration of the Exhibition in the Reichstag Building and Constitution of Sections.
(*The meetings of the Sections will be held in the Reichstag Building.*)
Afternoon: Visits to local Institutions, &c.

TUESDAY, SEPTEMBER 24.

9 o'clock a.m.: Meetings of Sections.
Afternoon: Meetings of Sections or Visits to local Institutions, &c.
Evening: Reception by the Municipality at the Town Hall (Rathaus).

WEDNESDAY, SEPTEMBER 25.

9 o'clock a.m.: Meetings of Sections.
Afternoon: Meetings of Sections or Visits to local Institutions, &c.
Evening: Gala Dinner.

THURSDAY, SEPTEMBER 26.

9 o'clock a.m.: Plenary Meeting in the Reichstag Building.
Afternoon: Meetings of Sections or Visits to local Institutions, &c.
Evening: Gala Representations in the Royal Theatres.

FRIDAY, SEPTEMBER 27.

9 o'clock a.m.: Meetings of Sections.
Afternoon: Excursion.

SATURDAY, SEPTEMBER 28.

9 o'clock a.m.: Meetings of Sections.
Afternoon: Meetings of Sections or Visits to local Institutions, &c.
Evening: Garden Party.

SUNDAY, SEPTEMBER 29.

10 o'clock a.m.: Closing Meeting in the Reichstag Building.
Afternoon: Voyage to Hamburg.
Evening: Social Meeting at Hamburg.

MONDAY, SEPTEMBER 30.

Visits to Hygienic Institutions and Establishments at Hamburg.
Reception by the Municipality at the Hamburg Town Hall (Rathaus).

Translations and Extracts.

USE OF FORMALIN IN THE TREATMENT OF CANKER OF THE FEET.

BY PROFESSOR SCHWENDEMANN (BERNE).

THE author recommends formalin in a solution of 35 per. cent. of water for the treatment of canker. The diseased parts of the foot are dressed with it once with a pledget of tow on a stick; the foot is then packed in tow, which is kept in its place by means of a boot or a bandage. A thick scale or crust forms which falls off in about three weeks' time, new healthy horn having formed under it. If there are any diseased spots remaining they are dressed in a similar manner.

The author makes the following observations: (1) Never use pure formalin. (2) Only apply it once. (3) If any diseased spots remain after the scale has come off dress them once with a 5 to 10 per cent. solution, taking care to avoid the healthy horn. (4) As soon as the animal is able to move put him to light work.

He truly says that a vast number of drugs have been recommended. Hoffmann, in his "Clinical Surgery," mentions forty-nine, and the list is not complete. The fact is, there is no specific.

There is no doubt that a radical operation is the best line of treatment, especially in the earlier stages, but it is not always practicable, as the long rest that is necessary is in many cases too expensive.

(*Schweizer Archiv. für Thierheilkunde.*)

ACUTE PNEUMONIA AND PULMONARY EMPHYSEMA IN A COW CAUSED BY A FOREIGN BODY.

BY DETROYE.

THE patient was a cow, and when the author was called in to her she had a large emphysematous swelling at the lower part of the neck and under the jaw that threatened to suffocate her. As she was in good condition she was slaughtered. When the carcase was cut up she was found to be suffering from subpleural and interlobular pulmonary emphysema. The lungs presented a number of patches of lobular pneumonia, and in the bronchi was a quantity of flax seeds. There were also indications of recent abortion.

On enquiry it was found that the cow was particularly wild and vicious, and had to be tied up, which was done with a cord round her neck, not a halter. She resented this and hung back violently, which caused the emphysema and abortion. The owner gave her a drench of linseed gruel, which went down the windpipe and set up pneumonia.

(*Bulletin de la Société Centrale de Médecine Vétérinaire.*)

STRANGULATION OF THE SMALL INTESTINE BY A PEDUNCULATED LIPOMATOUS TUMOUR OF THE MESENTERY.

BY SASSERRE.

THE animal, an aged horse that had never previously been sick, was attacked with colic. He was dull, his nostrils widely dilated, the face pinched up, and the conjunctiva injected. The bladder was full, but was emptied by a catheter. The horse lay down very carefully, but did not roll over or groan. A subcutaneous injection of hydrochlorate of pilocarpine and an enema of sulphate of soda was given, and a small quantity of fæces was passed. At the same time the patient vomited a small amount of fermented food through the nostrils. The animal's condition got worse, the hind quarters seemed incapable of sustaining his weight, and he sat up on them like a dog. He vomited a large quantity of food through his nose suddenly, and fell over on his side, dead.

The stomach was distended with a large quantity of fermented material, the small intestine was greatly congested at the anterior part, and in the middle of the jejunum was strangulated by the peduncle of a tumour that grew from the mesentery. This tumour was pear-shaped, of an orange colour, and the size of a man's fist. On examination it proved to be a lipoma.

(*Revue Vétérinaire.*)

ARASITIC ANEURISM OF THE LARGE MESENTERIC ARTERY; DEATH FROM INTRA-ABDOMINAL HÆMORRHAGE.

BY CARDON.

THE patient, aged 3, suddenly went off his feed, hung back in his halter, broke out into a sweat and trembled violently. The conjunctiva was pale in colour, the pulse very small, temperature 41·4° C., and the extremities cold. Internal hæmorrhage was diagnosed, and the animal died in half an hour.

On opening the abdomen a large quantity of blood escaped. The small intestine in the part that was supplied with blood by the left branch of the large mesenteric artery was much congested, and the vessels themselves plugged with thrombi; the other portions were anæmic. In the large mesenteric artery there was a large aneurism, the low wall of which was ruptured in a longitudinal direction. The walls of the aneurism were very thin and resembled connective tissue in structure. There was no thrombus in the sac, but some recently formed blood clots, and two sclerostomes; three others were found in the peritoneum. The liver was small, only weighing about 5 lbs. This was attributed to pressure on the hepatic artery, which interfered with its growth.

The author points out the extent of the lesions in so young an animal.

(*Recueil d'Hygiéne et de Médecine Vétérinaires Militaires.*)

TWIST OF THE NECK; "TORTICOLLIS."

BY PROFESSOR CADEAC.

TWISTED or distorted neck may be caused by a simple spasm, followed by muscular contraction. In some cases there may be dislocation of the vertebræ, but their mobility, their powerful attachments, and the nature of the articulations are all against their taking place, and fractures are very rare.

Usually twisted neck is the result of contraction of the muscles that causes the neck to take an abnormal position from the pain that accompanies it, and if not relieved, sclerosis, atrophy and adhesions will convert this simple temporary torticolis into a permanent deformity. The neck must be restored to its natural position, and to do this the animal must be completely placed under an anæsthetic, in order to overcome all muscular contraction. The animal is thrown on the convex side of the neck and a block of wood placed under the most prominent part so as to form a point of resistance to regular pressure, which is applied to the anterior parts of the neck on the concave side by the hands and knees of the operator. When the deformity is reduced the neck must be retained in the normal position. This can be done by fastening a side line from the surcingle to the head collar on each side, but this plan is inconvenient, as the head collar gets displaced on the side it is pulled upon, and is likely to injure the eye, the orbital arch and the temporo-maxillary articulation. The author uses a special apparatus over the upper part of the face, that comes down on each

side of the zygomatic ridge; it is furnished with a hook and attached to a ring on the surcingle by means of an india-rubber band. This traction by the elastic band is more graduated and continuous than by the rope, and not so distressing to the animal. If the malformation is of old standing, however, treatment is useless.

(*Journal de Médecine Vétérinaire et de Zootechnie.*)

GRANULAR DERMATITIS.

BY QUERAND.

SUMMER SORES.—During the hot season in Algeria, the author has frequently seen in horses that have previously suffered from wounds what he terms spontaneous summer sores.

The presence of the filaria gives rise to congestion of the dermis, which shows itself in the shape of slight elevations, with a flat, dry, hard surface, that do not adhere to the connective tissue. These rounded patches make their appearance in a few days; they are about the size of a shilling and are either single or confluent, and are most usually seen on the head and chest, but they may come anywhere, and the author has seen them on the conjunctiva, but in no case has he seen the lymphatics implicated. These patches give rise to most intense irritation, causing the horse to bite and scratch himself so that in a few days they are turned into irregular-shaped ulcers with irregular straight-cut edges; they extend through the skin very rapidly and then granulate.

When the ulcer is situated on the conjunctiva, cauterising it with sulphate of copper is usually successful, and a cure may be expected about the eighth day. This is, however, useless for wounds on the skin, and the author recommends picric acid, which he looks upon as a specific; a watery solution is of no value, and it must be dissolved in alcohol in the proportion of 10 per cent. and applied daily. The ulcers must be cleaned and carefully and thoroughly curetted with a spoon; all bleeding must be stopped, the blood carefully cleaned away, and the wound dried. The picric acid solution is then applied with a swab to the whole surface of the ulcer, and about ½ inch round the edges. The itching and irritation disappear with the first dressing, and with care the animal can be worked. The wound will heal, although slowly, even in the hottest weather.

(*Recueil d'Hygiene et de Médecine Vétérinaires Militaires.*)

DIFFERENT FORMS OF CATARACT IN THE HORSE.

BY METTE.

THE author makes the following observations from nineteen cases that he had an opportunity of studying. He points out that cataracts differ—(1) in their form, that is to say, they may be in lines, small points, patches, or cloudy diffusions, also they may be complete or incomplete. (2) In their nature or cause, *i.e.*, they may be caused by luxation, atrophy, &c. (3) The injury they cause, *i.e.*, diminution of vision, or total blindness. In some situations they do not interfere with the sight

at all. (4) In their origin, whether they are symptomatic or senile. A case of congenital cataract has not yet come under the author's notice. With regard to the situation, he classifies them into (1) capsular, (2) lenticular, and (3) capsulo-lenticular.

As regards No. 1, "capsular cataracts," there are three conditions that have been noticed, viz.: (*a*) Neoplasms growing from the internal surface of the capsule, which at this spot is usually thin and atrophied. The presence of fatty and pigmentary granules denotes that there has been a previous attack of iritis.

(*b*) A fibrous growth over the internal surface of the capsule.

(*c*) An epithelial growth from the capsule that penetrates into the substance of the lens.

As regards No. 2, lenticular cataracts, he has found: (*a*) sclerosis of the fibres of the lens, which becomes opaque and roughened on the surface. The nuclei of the fibres are in various stages of degeneration, and in the interspaces there are a number of crystals and round corpuscles (Morgagni's bulbs).

(*b*) A number of small cavities form in the lens that are filled up with granules of chromatin.

(*c*) The Morgagni's bulbs are filled with a fluid ("Morgagni's fluid") and an amorphous substance. In some cases these bulbs were collected together in masses.

(*d*) The fibres undergo fatty degeneration, but this is only a more advanced stage of the conditions (*a*) (*b*) (*c*).

(*e*) Cholesterin forms in crystals and lime salts are deposited, which grate under the knife when sections are cut. Hæmatoidin is also deposited in the form of crystals, which can be recognised by its greyish-red colour. It was present in almost every case of symptomatic cataract.

(*f*) The connective tissue was in various stages of degeneration.

The lesions seen in the third group, the "capsulo-lenticular," are only variations or combinations of the others.

The author's paper is illustrated with some exceedingly fine microphotographs.

(*Monatschefte für praktische Thierheilkunde.*)

THREE CASES OF STRABISMUS FROM DISTORTION OF THE POSITION OF THE HEAD IN THE HORSE.

BY CLERGET, FAYET AND NICOLAS.

In the first case the optic papillæ of the left eye was not in the axis of the orbit, but in the upper hemisphere. When both eyes were compared it was seen that there was inferior strabismus of the near eye, while there was no change in the off. At intervals the head was held in a position from above downwards and from left to right, so that the point of the nose was turned to the right side, "the normal one." In this position the left eye was below the right one, and the left side of the face, from the orbit to the nostril, was somewhat more curved than the right.

The second case was an eight-year-old horse that also was affected with inferior strabismus from the optic papillæ of the near eye being

in the upper hemisphere. The end of the nose was at intervals turned to the right, so that the direction of the ears and orbits were asymmetrical. The animal was very bad tempered, and was found to have double myopia. Small flocculi of lymph were floating about in the anterior chambers. He was accidentally killed, which enabled a *post-mortem* examination to be made, but nothing wrong could be found in either the eyes or brain.

The third case was in an eight-year-old mare that had superior strabismus of the right eye, with a large, nearly circular pupil, with contraction of the lower eyelid. The tip of the nose was carried to the right as in the two previous cases, the left orbit was carried lower than the right, and the left ear lower than the right ear.

From these facts the authors conclude that although the vision is perfect, horses may be affected with strabismus, and the head carried on one side.

(*Bulletin de la Société Centrale de Médecine Vétérinaire.*)

AMAUROSIS FOLLOWING AFTER INFECTIOUS PNEUMONIA; TREATED WITH STRYCHNIA; RECOVERY.

BY PROFESSOR FRÖHNER.

THE animal contracted infectious pleuro-pneumouia. On the ninth day there were symptoms of vertigo, and on the tenth he was quite blind. The pupils were widely dilated, and did not respond to the light, and the papillæ were quite insensible. The author concluded that there was paralysis of the optic nerve of central origin, basilar leptomeningitis. There was no trace of any injury to either of the eyes.

The case was treated with nitrate of strychnia, which was daily instilled into the conjunctiva, 3 centigrammes the first, 4 the second, and 5 the third day, with two days' interval. The result was surprising; in three months' time the left eye had become normal, and the right had greatly improved; the pupil, although still dilated, responded to the light. The author was induced to try strychnia in this case from the good results he had seen in the case of a dog that became blind from amaurosis after recovering from distemper.

(*Monatshefte fur praktische Thierheilkunde.*)

SACCHAROMYCOSIS OF THE NASAL CAVITIES IN THE HORSE RESEMBLING GLANDERS.

BY PROFESSOR DR. G. MARCONE, PISA VETERINARY SCHOOL.

NOCARD has reported a case of *Saccharomyces equi* in the pituitary membrane of the horse, which had a close resemblance to glanders, and Gotti and Brezzola one of blastomycosis. Both cases are exceedingly rare, although saccharomycosis of the conjunctiva is tolerably frequent, and both from clinical and sanitary reasons the following case is of interest.

The animal had been destroyed for certain severe lesions of the

respiratory passages that rapidly extended to both nasal cavities. On the left side of face there was a knotted cord that extended from the left nostril to the posterior extremity of the zygomatic ridge. Under the jaw there were two large hard glands that were lobulated, but except the lesions that existed in the nostril and on the face there was no appearance of farcy on the skin.

The wings of the nostrils, more especially the left one, were greatly thickened and indurated, and the skin was covered with scales, underneath which were a number of follicular patches, from which a drop of thick pus exuded when they were squeezed.

The skin round the nostril and the mucous membrane was thick and studded over with numerous depressions and elevations, varying from the size of a pin's head to that of a hemp seed, and covered with a thick, brownish-grey exudate that adhered to the part, and in places was tinged with blood. The thickening was so great that both the false nostril and orifice of the lachrymal duct were obliterated.

When the nostrils were opened it was seen that the lower turbinated bone was greatly enlarged, and that the mucous membrane, which was roughened, was studded over with ulcers about the size of a bean. The edges of these ulcers were elevated, and were overhanging; the pit was soft, pultaceous, and of a dark red colour. One of these ulcers was much larger than any of the others. The mucous membrane was of a blue colour, and there was no inflammatory zone round the ulcer.

The mucous membrane that covered the free border of the turbinated bone had disappeared in places and the bone was bare; in others it was covered with miliary nodules, round, elliptical, or in lines of a yellowish-white colour that contrasted sharply with the cyanosed membrane. When touched with the finger they felt rough, and their points were pitted and umbilicated. Where these nodules were closely studded together the membrane was no longer visible.

On the mucous membrane that covered the curved portion of the turbinated bone were about a dozen small pedunculated tumours, some of which were united into a lobulated mass, and in the antrum of Highmore the growth on the left side had extended to the maxillary bone and invaded the dental alveola, which over the third and fourth molars was reduced to the periosteum.

On the septum there was a tumour almost the size of a pigeon's egg, and the septum itself was perforated, the opening being about the size of a penny piece. This tumour was of a yellowish-pink colour, and covered over with small blood-vessels; it was smooth and glistening on the surface, soft in consistency, and when cut the surface had a marbled appearance in pink, grey and yellow.

Higher up on the septum were several other nodules about the size of a horse-bean, of a yellowish-white colour; they appeared to be like submucous abscesses, and contained a yellowish-white material streaked with blood.

The exudate from the nasal cavities, the scrapings from the nodules and tumours, all contained large quantities of saccharomyces.

This case is an interesting one, as it was one of primary saccharomycosis of the nasal cavities and sinuses. There was no lesion of the skin, and the corded lymphatic on the face was altogether a secondary complication.

Professor Tokishige was inclined to think that the lesions round the lips and nostrils were secondary, but this the author does not agree with. The possibility of primary blastomycotic invasion of a mucous membrane is shown in the case of saccharomycosis of the conjunctiva and membrana nictitans, which is not at all uncommon, and this one shows that primary saccharomycosis of the nasal cavities is also possible.

The clinical appearances and the pathological appearances both furnish sufficient material to differentiate between this disease and glanders. There are certain symptoms that are common to both diseases—the discharge, the enlargement of the wings of the nostrils and submaxillary glands, the corded lymphatics on the face, and the follicular ulceration of the skin surrounding the nostrils; but, on the contrary, there are differences in the characteristics of these common symptoms.

In glanders swelling of the wings of the nostrils is not common, and even when it occurs is not hard, as it is when the tissues are invaded with saccharomycosis. In glanders, in certain cases, there is superficial ulceration, whereas in saccharomycosis the skin is studded over with a number of minute perforations that are in close proximity to each other, and which give it a roughened feeling, as if the hand was run over a rasp.

The appearance of the ulcers and nodules of glanders are distinctive from the lesions of nasal saccharomycosis. In glanders the ulcer is pitted with elevated hard borders, and the pit is hard and covered with fine pink granulations; in saccharomycosis the edges of the ulcers are hollowed out and fissured, the bottom of the pit is soft and of a dark red colour. The edges are elevated and white or brown in colour. They are clearly delineated, and the red congested zone that is seen in glanders is absent.

In glanders the nodule commences in the form of a pink-coloured patch, which is surrounded by an œdematous zone, both of which are absent in saccharomycosis. In glanders this nodule develops rapidly, in saccharomycosis but very slowly. In blastomycosis the nodule is characterised by a brown umbilicated depression in the centre. The glanders nodule varies in size from that of a pin's head to a bean, that of saccharomycosis is much larger.

The presence of polypi is also sufficient to negative the diagnosis of glanders, as they never form on the nasal membrane in this disease. The organism is early found in the discharge from the nostril and the exudation from the ulcers.

If inoculation experiments are made for diagnostic purposes great care has to be taken, as abscesses are likely to form which may be mistaken for glanders. Tokishige states that the dog is refractory to saccharomycosis.

(*Revue Générale de Médecine Vétérinaire.*)

A CURIOUS CASE OF COLIC.

BY MERKLE (ROTTENBURGH).

THE patient was a well-bred Hungarian about seven years old. He had been ridden a short way in the morning, and returned to his stable in good health. Shortly afterwards he had a slight attack of

colic, which only lasted a few minutes. In the afternoon he was driven about four miles, but seemed dull, and was brought home again. When he returned to his stable he again was attacked with colic, which lasted for about two hours. These attacks came on about every third day, whether the horse was working or not, for about five weeks, when the period lengthened to six or eight days. This condition lasted for some time, when the attacks became of daily occurrence. In the intervals the horse appeared to be in perfect health.

After treatment for about three months without any effect, the horse was destroyed, as he was useless to his owner.

On examination a parasitic aneurism, caused by a *Strongylus armatus*, was found in the anterior mesenteric artery, with thrombi of old standing.

(*Wochenschrift für Tierheilkunde.*)

CASE OF DYSTOKIA FROM TWIN (EUSOMPHALIAN) MONSTER IN A COW.

BY M. C. FAFIN (VALOGNES).

THE animal, a Norman heifer, had been covered by her brother. The result was a double monster, with two heads and two bodies of normal dimensions, united in the middle. The owner, thinking the case was an ordinary one, had fixed cords on the head and two limbs that were presented, but in his efforts he had only succeeded in pulling them off. He then examined and found two more limbs, but failed to extract the fœtus, and the author was called in.

He found the case much complicated by the folds of skin that had been torn off, which made it difficult to ascertain the true state of affairs. He found that there were two limbs in position, but was unable to make out if they were fore or hind ones. No head could be detected, nor at first the tail; later on this was found bent backwards over the croup, and it was thought that the calves were twins, the upper being presented in the anterior the lower in the posterior position. Delivery was attempted in the usual manner adopted in such cases, viz., by pushing back the upper calf while traction was applied to the lower one, but these manœuvres were unsuccessful.

A further examination was then made, and with the tips of the fingers a head was discovered as if it were bent down, while the calf was on its back. A hook was fixed into the orbit, the limbs secured with cords, and another attempt made to push back the upper calf, and bring forward the head of the lower one. This failed, and then the author began to suspect the existence of a double monster. This suspicion he confirmed with some difficulty, as his manipulations were greatly hampered by the folds of skin. He then proceeded to remove the head and fore limbs, and to ascertain the point where the two fœtuses were united together. He then managed to introduce his hand into the thorax of the upper calf and extract the contents; he was able to do this from the fact that the walls were very thin and weak. The same was done with the lower calf, and hooks fixed

into the two necks and sides. The hand was then passed through the diaphragm into the abdomen and the viscera extracted, which greatly reduced the size of the calves, and permitted the quarters being touched. The hock was then first grasped, and then the foot, and the lower calf turned, during which operation the two became separated from each other, and delivery was effected. All this, however, took six hours of what the author terms *manœuvres longues et pénibles.*

The heifer made a rapid recovery, and the after history of the case was uneventful.

(*La Semaine Vétérinaire.*)

CASE OF DISLOCATION OF THE PATELLA.

BY M. PAUL HAAN, ASSISTANT VETERINARY SURGEON, 2ND DRAGOONS.

CERTAIN authors have doubted the existence of true dislocation of the stifle joint in the horse, but this case is so clear that the author thinks it is worth while publishing it.

The subject was a cart horse about ten years of age, that was found one morning standing on three legs in the stable. He had always been used for draught work and was very quiet, of an almost phlegmatic disposition, and had never been known to get fresh or kick about when first put into harness. When the author first saw him he was standing on three legs, and when moved went like a lame dog goes. The near hind leg was flexed up under the abdomen, and the toe, instead of being dragged along the ground as is the case in false laxation or cramp in foals, was about 2½ feet from it. This symptom much puzzled the author, as the characteristic of luxation of the patella is always described in text books as the limb being forcibly extended backwards.

Careful examination clearly showed that the seat of the mischief was in the thigh. There was a thick hard cord right over it, extending to the point of the hip formed of the posterior portion of the long vastus muscle, the fibres of which were in an almost tetanic condition. The thigh itself was swollen, deformed, and painful, and the patella, which was dislocated outwards, was kept in this position by the lower tendon of the long vastus muscle, which is inserted into the outer ligament of the patella.

Internally the swelling was more marked, and the possibility of a complete rupture of the small ligament of the femur and patella was suspected, and there could be but little doubt that the case was one of complete dislocation outwards.

The first attempts at reduction failed, as any endeavour to extend the limb either forwards or backwards was at once resented by the patient. A side line was passed round the cannon, and the limb gradually and gently drawn forwards, while at the same time three powerful assistants pressed against the quarter to prevent the animal turning round, and the author, with another assistant, pressed with all their force against the dislocated patella to push it into position, which after a few seconds it did, with a loud crack that almost resembled a pistol shot. At the same time the hard cord disappeared,

the limb was brought to the ground, and the animal was able to move, although he was still very lame. A strong blister was put on the joint, three weeks afterwards he was put to work, and has been working for over two months.

The author then goes on to point out that this case in all respects resembles the true luxation of the patella in the dog that is described by Cadiot and Almy, and which is common in black-and-tan terriers, but which is quite different to cramp in foals where the limb is *extended* backwards, whereas in this case it is *flexed*, and no weight can be put on it. The patella completely comes out of the cavities, and is not merely over-riding on the ridge that is formed by the internal lip and upper extremity of the trochlea of the femur. It is not only tension of the internal ligament that brings about this condition, but the external one also, which is pulled tight by the long vastus muscle.

(*Revue Générale de Médecine Vétérinaire.*)

FILARIA OCULI.

BY M. LÉGER, HAÏPONG, TONKIN.

FILARIA oculi is fairly common in the French possessions in Indo-China, and M. Léger has seen three cases in one year in native horses.

Attention is first attracted to the diseased eye by the flow of tears, intolerence to light, and the milky-white opacity of the cornea (keratitis). When closely examined the parasite can be seen swimming about in the anterior chamber of the eye.

The author at first thought that on the degree of the opacity the urgency of the operation depends, and that this opacity does not tend to diminish. In an animal that was operated on on August 28, 1904, the cornea was completely white, and it still remains so. In two others that were operated on on April 8 and August 31, 1905, the cornea was not altogether opaque, and they are in the same condition. Since then he has had reason to change his opinion, and on December 7, 1906, he reports that he has seen the horse that he operated on on August 28, 1904, and that the eye had nearly cleared up, there being merely a slight film on the inner circumference. The horse, who was absolutely blind of the eye when the operation was performed, could now see perfectly.

It is advisable to perform the operation as soon as possible, but M. Léger's case shows that there is no reason to despair, even if it is of considerable standing.

The operation itself is simple enough. The animal is thrown on the side opposite to the one that is to be operated on, cocaine applied, and the eyelids kept open with a speculum. The eye is disinfected and an incision made in the lower border of the cornea with a Gräefe's knife, that is introduced parallel to the iris; a quarter turn should be given to the knife to open the lips of the wound. The parasite almost always escapes with the aqueous humour, which is quite clear and limpid, but if it does not it can be withdrawn with a pair of fine forceps. The eye should be bandaged after the operation.

The life-history of the parasite is not known, but possibly it is

a form of *Filaria equina* or *papillosa*, which is common in the peritoneum of horses in all countries. This parasite is found in all the serous membranes, more particularly in the pleura and arachnoid, so there is nothing extraordinary in its being found in the anterior chamber, which itself is only a serous cavity. The reason why it is so much more common in India and Indo-China is that the *Filaria equina* is much more common in those countries than in Europe or America, and the hot, damp climate favours its development. It is quite possible, also, that there may be an intermediate host that is common in those countries.

The author is of opinion that in all cases an operation should be performed with as little delay as possible.

(*Recueil de Médecine Vétérinaire.*)

AMPUTATION OF THE PENIS.

BY G. ROMANO, VETERINARY LIEUTENANT, IE REGIMENT DE ROSIORI, ROUMANIAN ARMY, GALATZ.

THE patient was an Hungarian, aged 8, that was constantly being attacked with colic, and it was noticed that when he staled the penis was never protruded from the sheath. On exploring it a large ulcer was found extending over the glans and front of the organ. The wound had been formed by the coalescing of a number of smaller ones, and was deeply pitted, with hard, indurated, irregular edges, bleeding, and very foul. There was a discharge of fœtid pus, and a tendency for fistula to burrow into the corpus cavernosum. The urethral opening was constricted, and the urine discharged in a fine thin jet. The penis was continually retracted, and there was great pain, which rendered examination very difficult.

Various drugs were tried without success, and on July 24, as gangrene had set in, an operation was decided upon and performed the next morning, the animal having been put under the influence of chloral hydrate. He was cast and placed in the dorsal position, as if for castration, and the part carefully cleansed and disinfected. The instruments used were a pointed bistoury, a grooved director, fine bull-dog forceps, a pair of curved scissors, a Reverdin's needle, silk, and a catheter.

In order to ascertain the extent of the wound an elastic catheter was passed into the urethra. The penis was then held by an assistant parallel to the abdomen and drawn forward, and two incisions were made on the lower portion at about 5 inches from the extremity, and a little behind the line of demarcation between the gangrenous and healthy portions. These incisions, about 2½ inches in length, were carried backwards, diverging from each other, and a third united them, so that a triangle was formed with the apex directed backwards, and the skin and tissues contained in it were dissected out right down to the wall of the urethra. This was punctured, and the grooved director introduced alongside of the catheter, and the urethra slit up to the apex of the triangle. The walls of the

urethra were then stitched to the skin of the penis with three separate silk sutures.

A circular incision, which was in reality a continuation of the one that formed the base of the triangle, was made in the skin and corpus cavernosum, the dorsal artery ligatured, and the smaller vessels secured with bull-dog forceps. The anterior portion of the penis was removed by the urethra being divided about a quarter of an inch in front of the circular incision in the corpus cavernosum.

The skin covering the penis was then drawn forwards, and secured to the lips of the exposed urethra with four interrupted suture points. This was easily done, as when the circular incision was made the skin was drawn backwards by an assistant.

The wound was well irrigated with a 3 per cent. solution of carbolic acid, and then dressed with iodoform and collodion, which had the double advantage of penetrating into the lips of the wound and the threads of the sutures, as well as forming a protective covering to the part. The operation lasted thirty-five minutes.

For a week afterwards the part was alternately washed with a 1 per cent. solution of corrosive sublimate and a 3 per cent. solution of carbolic acid, and the part powdered over with iodoform. This was done immediately after each evacuation of urine, and was easily accomplished, as the penis was protruded from the sheath. There was no pus formed, only a slight discharge of serum, and a free stream of urine showed that there was no contraction.

On August 1 the horse was again cast and the sutures removed. The lips of the wound were then firmly united, and there was no irritation or inflammation. From this date the wound was washed only three times a day, finally this was discontinued, and the animal discharged from the hospital.

The amputated portion of the penis resembled a cauliflower, and was formed of fibrous connective tissue, riddled with sinuses that were filled with a greenish-yellow coloured pus: it weighed a little over 5 ozs.

This method, which is used by Codiet in human surgery, is stated by the author to be most highly successful, and free from the danger of subsequent complications. It is the one that has been recommended by Harrison in the VETERINARY JOURNAL of 1885.

The author says that the advantages of these modifications of the original operation can only be appreciated by the actual performance of it. He finds that by avoiding the circular incision that is usually made, a large wound with profuse hæmorrhage is avoided, and that the skin and urethra can be more easily sutured together. The incision through the skin and corpus cavernosum can be made gradually, and the hæmorrhage stopped at once, either by ligaturing the vessels or by pressure, as desired, much more effectively than with an elastic band, which has been advocated by some authorities.

(*Archiva Veterinariá, Bucharest.*)

PARASITIC ANEURISM OF THE AORTA AND CŒLIAC AXIS, THROMBOSIS OF THE CŒLIAC AXIS, AND PARTIAL EMBOLISM OF THE LARGE MESENTERIC ARTERY.

BY CASTEX.

THE horse, a four-year-old, was attacked with slight colic that passed off in about an hour, leaving the animal dull, as if he had been overworked. The pulse was thick and very weak, but the mucous membranes were normal. The animal died about five hours after the first commencement of the attack.

Post-mortem.—The peritoneum was very pale in colour. From the point of entrance into the abdomen to the cœliac axis the aorta was increased in size, and just behind the renal arteries there was a large aneurism 10 centimetres long by 7 centimetres in diameter.

The cœliac axis itself was a large aneurism filled with a blood clot the size of a hen's egg that weighed about 40 grammes, which the blood in the aorta flowed against. The clot was elastic in consistency, adherent to the walls, and gave off prolongations into the splenic, gastric, and hepatic arteries. In the cœliac axis between the walls and the clot there were several small flakes of bony material.

Inside the aortic aneurism were several false membranes made up of a very fine red fibrous material, with several sclerostomes and a small quantity of fluid blood. The lining membrane of the artery was inflamed, particularly at the points that the contained clot adhered to, and there were also several small ulcers. On the bottom of the aneurism there was a small round piece of bony material about 2 centimetres in diameter by $\frac{1}{2}$ millimetre in thickness.

The large mesenteric artery was about the size of the little finger; it was partly obstructed by some loosely adherent fibrous clots, amongst which a few sclerostomes were found. The total number of the parasites taken from the aneurisms was twenty-one.

In the stomach were about 200 bots, and in the large curvature of the right sac there was a blood clot that weighed about two pounds.

There were more bots in the duodenum, cæcum and colon, and in the small intestine, cæcum and colon a considerable quantity of coagulated blood.

There was a number of ecchymosed patches on the endocardium, but the other organs were healthy.

The author thinks that the gastro-intestinal hæmorrhage was caused by the numerous small wounds made by the parasites.

(*Recueil d'Hygiéne et de Médecine Vétérinaire Militaires.*)

HÆMORRHAGE AND CYSTS IN THE SUPRARENAL CAPSULES, WITH THROMBOSIS OF THE POSTERIOR AORTA, IN A HORSE.

BY DETROYE.

THE animal, a mare, had been destroyed, having fractured her right femur. During life she was said to have been very lazy and drowsy, and subject to cramp in the hind legs when worked.

The author made a *post-mortem* examination, and found that the kidneys were greatly enlarged and adhering to the neighbouring structures, and were studded over with a number of small cysts, "the largest of which was about the size of a hen's egg," the contents of which in some instances were clear, in others thick and purulent. They invaded both the cortical and medullary part of the kidneys, and in both these parts there were the lesions of interstitial nephritis. In those portions in which there were no cysts the tubes were separated from each other by infiltrated urine. The mucous membrane lining the pelvis was thickened.

The suprarenal capsules were enlarged, lobulated in shape, and over the surface were scattered a number of red patches, the remains of congestion. Just in front of the bifurcation of the posterior aorta there was an elongated aneurism, in the centre of which was an old fibrous clot, surrounded by another of more recent formation that adhered to the walls of the artery. The lining membrane of the artery had disappeared in places, and the muscular coat was atrophied and studded over with calcified patches. There was only a narrow channel between the upper part of the clot and artery, by which the circulation was carried on.

The cause of this condition of things is not well understood: the atheromatous degeneration of the aorta and the thrombosis can be attributed to functional derangement of the suprarenal capsules, which in their turn were caused by the thrombosis interfering with the circulation.

(*Bulletin de la Société Centrale de Médecine Vétérinaire.*)

TUMOURS IN THE NASAL CAVITIES OF THE OX.

BY PROFESSOR G. MOUSSU (ALFORT).

GROWTHS in the nasal cavities of the ox are of either parasitic origin or true tumours. The first, which are the most common, are of tubercular or actinomycotic origin. True tumours are benign, malignant, and those that cannot be classified among the latter, but which, nevertheless, cause death. A growth in the nasal cavities necessitates removal, or else the subsequent slaughter of the animal if the lymphatic glands are not affected, if they are it is better to do this at once. In the case of a benign growth an operation is generally successful, especially if it is performed at an early stage, as the two cases quoted will show.

The first was an ox that had been ill for about seven months. The animal was in very bad condition, and the left side of the head was greatly enlarged and deformed from the eye to the nose; the skin covering it was, however, healthy and normal. The bone, which was thin and rarefied, had disappeared in places in patches the size of a two-shilling piece, and over these places there was a fluctuating sensation. There was a flat, hard, bony tumour in the left nasal cavity, extending back into the pharynx. The lymphatic ganglia were normal. Respiration was difficult, and there was a loud roaring sound.

On *post-mortem* examination it was found that over the fluctuating spots on the maxillary sinus the bone had been absorbed, and when the skin was removed about a pint of gelatinous yellowish-

white material escaped. The tumour turned out to be an osteo-chondroma, its point of origin being the turbinated bones.

The second case was a young Normandy cow. Early in 1906 she was noticed to be breathing with difficulty, also that the right side of the face was deformed, and that there was a polypus in the right nostril. This was removed, and it was then discovered that there was a tumour extending high up into the cavity.

When the author first saw the animal the right side of the face, particularly at the upper part of the cheek, was swollen and deformed, the skin over it being tense and painful. In the right nostril the lower part of the tumour could be seen, it being of a yellow colour, soft in consistency, and appearing to be a myxoma. The hard palate was deformed and ulcerated on the right side, where most of the upper molars had fallen out. When feeding, the difficulty in breathing became much worse, and became aggravated into a loud roaring noise. The lymphatic glands were, however, unaffected. As the case was hopeless without an operation, to which the owner would not consent, the animal was destroyed.

On *post-mortem* examination it was found that the tumour extended from the nasal cavity to the maxillary sinus, and had commenced from the turbinated bones. Most of the growth was an osteoma ; the outer portion, however, was a myxo-sarcoma.

In both these cases the disease was old standing, and in them an operation would have been useless; it is only practicable when the growth is small, the palate not implicated, and the general health and condition of the animal have not suffered. As regards the operation, M. Moussu gives the following general directions :—

(1) A rectangular piece of skin is removed, the landmarks of which are the central line down the face, a line connecting the lower edge of orbits, a line drawn at right angles to the middle line of the face from the lower extremity of the nasal bone.

(2) That the opening into the nasal cavity should be ample in size, extending to the frontal, lachrymal and upper maxillary bones.

(3) That the abnormal contents of the cavity be completely removed.

(4) That ample drainage be provided.

(Recueil de Médecine Vétérinaire.)

INVERSION OF THE BLADDER AND TORSION OF THE UTERUS IN A COW.

BY DR. WYSMANN (NEUENEGG).

INVERSION of the bladder, which is frequent in the mare, is not common in the other domestic animals. Harms, Arvant, Guittard, Taylor, only mention isolated cases in the cow, and Esser, Guittard, Neale and Skar in the sow.

In the author's case there was also a twisted uterus three or four turns from left to right. The everted bladder had the appearance of a red-coloured pear-shaped growth about the size of a man's fist.

The bladder was first replaced and then the uterus was untwisted; in a quarter of an hour a live calf was born.

(Schweizer Archiv für Tierheilkunde.)

THE USE OF MERCURY AS A DISINFECTANT IN CATTLE PRACTICE.

BY DORN.

THE majority of disinfectants in common use have a disagreeable smell that causes the meat to be unsaleable in case the animal has to be destroyed. Corrosive sublimate has the reputation of being dangerous to use with cattle, but the author states that he has never noticed any bad effects from its use. He has treated foul in the foot with a 1 per 1,000 solution, and surgical wounds, and irrigation of the vagina or uterus in case of retention of the fœtal membranes, with a 1 per 3,000. He highly praises the preparation known as "sublamin," "sulphate of diamine ethyline mercury." It is sold in the form of white crystals, soluble in water and glycerine, slightly soluble in alcohol, and does not injure instruments. It is made up in coloured tabloids, and has but a slight affinity for water.

Solutions of sublamin are deodorisers, and are of great service in cases of retention of the fœtal membranes; it does not injure the hands in the way that cresyl or carbolic acid does.

(*Berliner tierarztliche Wochenschrift*).

TREATMENT OF TRAUMATIC ARTHRITIS.

BY PROFESSOR CADEAC (LYONS.).

TRAUMATIC arthritis is an injury that usually comes under the notice of the practitioner from its earliest stages. It is characterised by alteration in the synovia, fever, the part being inflamed, and lameness. The synovia becomes thick and cloudy and of a grey or yellow colour, from the exudation of fibrin and leucocytes. These alterations in the nature of the synovia depend on what sort of organism gains access to the cavity; if they are staphylococci the fluid is purulent and clotted, if the infection is septic it is brown in colour, fœtid, and full of small air bubbles. The joint becomes filled with pus, and the swelling, which was at first diffused, becomes limited to its vicinity, and unless active steps are taken the cartilage is perforated in a number of places; necrosis of the ligaments sets in, with granulation from the bony structure.

Treatment must be adopted to destroy the organisms in the joint, but unfortunately the fibrinous exudates in it are excellent breeding grounds and protect them from the antiseptics that are employed. The author recommends opening the joint freely so as to give free drainage, and the injection of van Swieten's fluid, a 1 per cent. solution of iodine and oxygen water, all of which are excellent, but he prefers the latter on account of its more extensive radius of action from the gas that is given off. The part should be shaved and an antiseptic dressing applied to prevent fresh infection. Blisters are to be avoided, as they are likely to give rise to secondary inflammation.

(*Journal de Médicine Vétérinaire et de Zootechnie.*)

HERNIA OF THE UTERUS IN THE BITCH.

BY CUNY.

THE horns of the uterus are sufficiently long and loose to easily slip into the inguinal canal, where they form a small reducible tumour just behind the mammary glands. When the animal gets in pup the tumour enlarges, but there is no pain or inconvenience till labour commences. The fœtus is too large to pass through such a small passage as the canal, and unless relieved the mother dies. Either the Cæsarean section or partial hysterectomy has to be performed. If it is desired to save the pup and sacrifice the mother the operation should not be performed till the pains are well set in, but if the contrary, the sooner it is done the better.

The author has been able to save both mother and pup. In one case he operated at once and was able to reduce the hernia after dividing the ring. He found that moderate pressure on the gravid uterus did not cause abortion. In another case partial hysterectomy performed early was a complete success; he found that he could remove a portion of the gravid uterus, containing two pups, without causing abortion, and that parturition took place naturally at the full term.

Early operative interference gives excellent results and permits of both the fœtus and mother being saved, as the reduction of the hernia and partial hysterectomy are less dangerous than the Cæsarean section.

(*Journal de Médecine Vétérinaire et de Zootechnie.*)

TREATMENT OF SUMMER SORES WITH A CONCENTRATED SOLUTION OF SULPHATE OF COPPER.

BY INGUENEAU.

Prophylactic Measures.—The smallest wounds are dressed with a 20 to 30 per cent. solution of sulphate of copper, and the first application is enough to stop the discharge, that attracts flies and gives rise to itching. A second application covered over with powdered charcoal forms a thin scale that protects the wound and allows it to cicatrise.

Treatment.—The wound should be well curetted, so as to remove all luxuriant granulations, and then well saturated in the solution of sulphate of copper and covered with a compress dipped in the same, or, if this is impossible to apply, dust it over with finely powdered charcoal. The dressing should be renewed every other day.

(*Recueil d'hygiene et de Médecine Vétérinaire Militaires.*)

THE TRANSMISSION OF BOVINE PLEURO-PNEUMONIA TO SHEEP AND GOATS.

BY ED. DUJARDIN-BEAUMETZ.

CONTAGIOUS pleuro-pneumonia has always been considered to be exclusively a disease affecting bovines. Willems, however, has successfully inoculated goats, sheep, dogs, pigs and birds. Goats and sheep, however, proved refractory to pure virulent lymph prepared by

Pasteur's method, and the epidemics reported in goats and camels have nothing in common with the contagious pleuro-pneumonia of bovines. Since the discovery of the pathogenic agent, Dujardin-Beaumetz has found that with beef serum added to Martin's bouillon, successive cultures retain their virulency, but that no results are obtained with any other animals except bovines.

In order to overcome the resistance of refractory animals, the author has substituted for beef serum that of the same species of animal as that in which the inoculation is to be made; in the case of sheep the bouillon is prepared from mutton, with the addition of sheep serum in the preparation of 10 per cent. The organism thrives in this medium, and in a dose of 10 cc. produces an œdema resembling that seen in the ox, and which is in some cases accompanied with arthritis. The characteristic organism is found in the œdema, the synovial fluid, and even in the blood. It passes through a Berkefeld filter, grows in bouillon and serum, and gelose and serum. When inoculated with bovines it gives rise to a considerable enlargement, but the serum obtained causes no local reaction in sheep.

The horse is altogether refractory to pleuro-pneumonia, even when inoculated with cultures grown in bouillon and serum prepared from horse-flesh. Cultures grown in this equine medium when injected into sheep, produce the same effects in these animals as cultures grown in bouillon and serum prepared from mutton, and goats respond in the same way as sheep. The virus has been preserved for five months in a pure condition in the udder of a milking ewe. By a similar process the natural power of resistance of antelopes, deer and camels has been overcome.

The author then proceeds to discuss the action of virulent cultures on the sheep and ox. Cultivations in sheep serum are as active in bovines as those grown in ox serum. Oxen that have been inoculated with cultures grown in bouillon and horse serum either give no reaction at all, or a very insignificant one, but they acquire immunity against virulent material. This raises hopes that a method of vaccination may be discovered.

The influence of the serum is perfectly evident, but it is difficult to explain its action. It does not attenuate the virus, as cultures in bouillon and horse serum are avirulent with bovines, which are very susceptible, and hyper-virulent in sheep, which naturally are refractory.

The serum from a cow that had received large quantities of virulent culture has been shown to have protective power, but not curative or agglutinative (Nocard, Roux, Dujardin-Beaumetz), and the serum from hyper-immunised sheep is not agglutinative. A horse received 1,500 cc. of culture grown in bouillon and horse serum weekly for four months, but the serum had no curative action even when given in doses of 250 cc. This serum had agglutinative properties, and precipitated the serum from animals that had suffered from a previous attack of the disease. Possibly this property may be used to diagnose latent forms of the disease.

(*Annales de l'Institut Pasteur*).

TREATMENT OF MAMMITIS.

It is now pretty well established beyond doubt that mammitis is of microbic origin, and that the organisms gain access to the glandular acini through the teat. The disease seldom originates from the blood or lymph vessels. According to the nature of the organism and its virulence, so the results that they cause are usually some derangement in the secretion of the milk.

Usually antiseptic injections are used, and Schultze and Storkow recommend the following procedure:—

The affected quarter is completely emptied of milk, and then carefully washed with tepid soap and water, and disinfected with a 3 per cent. solution of creolin. A 3 per cent. solution in camphorated spirit or oil is then injected deeply into the gland through the canal, and the whole is well massaged, so that the injection penetrates into the deepest parts, and is repeated three times a day.

All the cows they have treated have rapidly improved, the pain and swelling have disappeared, and the secretion of milk has been gradually re-established.

(*Berliner tierarztliche Wochenschrift.*)

DEATH FROM BURNING.

BY CYCKMANN AND VON HOOGENHUILL.

The authors, after an exhaustive series of observations, have arrived at the following conclusions:—

(1) When the skin has been exposed to the action of heat for a long time death takes place from paralysis of the heart.

(2) In some cases that are not fatal they have noticed a very large diminution in the number of the red blood corpuscles, with hæmoglobinuria, and they consider that such changes in the blood do not cause death.

(3) The action of heat causes the skin to produce toxic substances, which, when absorbed, cause death.

(4) Toxins are not formed in burned muscle.

(*L'Echo Vétérinaire.*)

THE EFFECTS OF LIGHTNING ON HORSES.

BY JOUVEAUX.

During a thunderstorm a stable was struck by lightning. A man who was asleep in a spare stall was awakened up by the noise and saw the two horses on each side of him fall over to the right and left, "as if knocked down," but they got up at once. All the other horses were pulling back on their head collar chains and were very frightened.

It was found that in addition to abrasions from hanging back in the head collar, thirteen horses had the hair under the jaw burned in a circular patch about an inch in diameter. The lightning had evidently followed the ironwork of the mangers, which were joined together, and then up the collar chains to the buckle under the jaw on

the head collar. Several other horses were burned on the side of the neck, and in two there was a swelling which lasted for about a week.

(*Recueil d'hygiène et de Médecine Vétérinaires Militaires.*)

CLEANING SURGICAL INSTRUMENTS.

PLACE the articles for twelve hours in a saturated solution of chloride of tin, which will remove all stains, then wash with soap and water and polish with powdered chalk and vaseline.

(*L'Echo Vétérinaire.*)

THERAPOGEN.

BY M. H. R. BREDO, GOVERNMENT VETERINARY SURGEON, MALINES, BELGIUM.

THERAPOGEN is an organic compound formed by the dissolution of a non-poisonous series of terebines that are closely allied to the group of naphthols in an alcoholic soap formed from linseed oil. It is a clear, pale yellow coloured, slightly opalescent fluid, of a syrupy consistence and an alkaline reaction. It has an agreeable aromatic smell, especially in solution, with an astringent and slightly piquant taste. Its density is slightly lower than water. At a temperature below 80° C. it becomes cloudy, but clears up again when heated slowly; if exposed to a high temperature part of the aromatic principles are driven off. It therefore has to be kept in well-stoppered bottles and used in solutions of a medium temperature, neither too hot or cold.

It dissolves in equal parts of distilled water, alcohol, ether, glycerine and oil. A solution in ordinary water has a slightly white colour, but is not opaque and does not render it difficult to find small surgical instruments placed in it. If a solution is shaken it becomes somewhat frothy. It will not injure steel instruments even if they are left in it for a long time. It has powerful antiseptic, antiputrid, and parasiticide effects, both pure and in solution. Drs. Aufrecht and Troster, of Berlin, and Quasler, of Venice, have reported on it.

In a 1 per cent. solution the bacillus of glanders is killed in fifteen minutes, Eberth's bacillus in fifteen minutes, and the *Staphylococcus pyogenes* in one hour. In a 3 per cent. solution the spores of anthrax are killed in an hour, and the bacillus of glanders in ten minutes. In a 5 per cent. solution the gonococcus and bacillus of diphtheria are destroyed in from one to five minutes. These results show that its action is superior to most disinfectants, especially carbolic acid. Its action as a deodoriser is threefold—it arrests fermentation, it destroys certain odours and masks others. Even fairly concentrated solutions will not irritate the skin or mucous membranes, on the contrary, it has an astringent and slightly anæsthetic action on them. Given by the mouth it increases the secretions of the stomach and intestines, also the peristaltic movements, and arrests fermentation of their contents; it promotes the secretion of urine and stimulates bronchial secretion. It is not poisonous, as much as 5 grammes per kilogramme

live weight have been given to rabbits and dogs in a solution of gum without any ill result.

Therapeutics:—Externally.—(1) As an antiseptic in a 2 to 3 per cent. solution in equal parts of alcohol and water, or plain water, it is a powerful antiseptic, has an agreeable smell, does not injure instruments, is not poisonous or irritating, and does not give rise to hardening or swelling of the skin. (2) It can be used in a 1 to 3 per cent. solution as a disinfectant, deodoriser, or astringent, in the treatment of wounds or inflammation of various structures, *i.e.*, eczema, &c., inflammatory affections of the mucous membranes, caries, purulent cystitis, &c.; it is also of value in obstetrics, catarrhal affections of the ear, conjunctivitis, &c. (3) In a 3 to 5 per cent. solution it is an active parasiticide in mange, sheep scab, &c. (4) It is a powerful antiseptic and deodoriser, and is most useful for the disinfection of meat markets, butchers' shops, &c., where one with a powerful penetrating smell cannot be used. (5) For the same reasons it can be used in kennels and stables.

Internally.—(1) As a stimulant and tonic in atony or torpidity of the stomach or intestines. (2) To arrest fermentation of ingesta and disinfect the gastro-intestinal tract. (3) As an anthelmintic. (4) As an expectorant and diuretic.

Doses and Methods of Use: Externally.—In a solution of from 1 to 10 per cent. in water, spirit or glycerine, or as a liniment or ointment.

With an absorbent or desiccated powder it is recommended in the treatment of eczema. The following formula will be found useful:—

Therapogen, powdered starch, borax ...	5 grammes	ãã
Oxide of zinc	10	,,
Talc	60	,,

De Flatten's soap is a preparation of therapogen.

Internally.—It can be conveniently given in water or spirit and water, mucilage, gruel, &c. The dose for the horse and ox is 20 to 40 grammes, and the dog 1 to 5 grammes.

(*L'Echo Vétérinaire.*)

Correspondence.

To the Editors of the VETERINARY JOURNAL.

DEAR SIRS,—May I venture to ask your kind support and assistance, through the columns of your valuable paper, in making known to the veterinary profession the intention of a number of members to recognise in a tangible way the services of Mr. Hunting to the profession. Trusting that the movement will meet with a large and generous support, and thanking you in anticipation of your ready assistance.

I am, yours faithfully,

JNO. MALCOLM,

Hon. Secretary.

PROPOSED TESTIMONIAL TO MR. WILLIAM HUNTING, F.R.C.V.S.

To the Members of the Veterinary Profession.

MR. HUNTING'S retirement from the editorial chair of the *Veterinary Record*, after nearly twenty years' tenure of that arduous position, has been suggested to provide a fitting opportunity for his professional brethren to mark in a tangible manner the long and yeoman service he has rendered to the profession. In bringing this proposal before you, we do not think it necessary to attempt to enumerate all the claims which Mr. Hunting has established to the gratitude of the veterinary profession. His editorial and other contributions to the columns of veterinary periodicals have made his name a household word in the English speaking veterinary world, while his unceasing efforts to advance and defend the interests of our profession have laid us all under a deep debt of obligation to him. We believe that no member of the profession has ever striven more strenuously and unselfishly for our common interests, and while we cannot hope to make any adequate return for his self-sacrificing labours, we are confident that a great many members of the profession will approve and actively support the proposal to present him with some fitting token of the admiration and respect in which he is generally held by his *confrères*.

Subscriptions may be sent to the Treasurer or to any member of the Committee.

We are, yours faithfully,

JOSEPH ABSON, Sheffield,
Chairman of Committee.
WM. BOWER, East Rudham.
THOS. A. DOLLAR, London.
JOHN M'FADYEAN,
Principal, Royal Veterinary College, London.
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F. W. WRACG, Whitechapel.
JNO. MALCOLM, Holliday Street Wharf, Birmingham,
Hon. Secretary and Treasurer (pro. tem.).

New Instruments and Appliances.

NEW TUMOUR FORCEPS.

BY E. WALLIS HOARE, F.R.C.V.S.

ALL practitioners who have had experience in the removal of deep-seated tumours must have encountered the difficulties of drawing the growths upwards to the surface of the operation wound with the ordinary means at command.

Many forms of tumour hooks are in use for the purpose of raising tumours so as to expose their base for dissection, but these often slip at a critical moment. A ligature through the substance of the tumour is often unsatisfactory for this purpose.

The present forceps are constructed with points resembling the ordinary fishing hook, and they will retain a firm hold, even of a superficial portion of the growth. They are made in two sizes:

No. 1, small, for small tumours and for canine surgery; No. 2, large, for equine surgery.

The makers are Messrs. Arnold and Sons, West Smithfield, London.

Books and Periodicals, &c., Received.

Board of Agriculture and Fisheries; Department of Agriculture and Technical Education for Ireland; American Veterinary Review; Journal of the Royal Army Medical Corps; Agricultural Journal of the Cape of Good Hope; Tropical Agriculturist, Ceylon; Rhodesian Agricultural Journal.

Letters and Communications, &c.

S. Locke; J. McKinna; J. Malcolm; Dr. Nietner (Berlin); W. Robb; Professor Craig.

NOTE.—All communications should be addressed to 8, Henrietta Street, Covent Garden, London, W.C. Telephone, 4646 Gerrard. Telegrams, "Baillière, London."

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Illustrations for reproduction should be in good black or dark brown on white paper or card.

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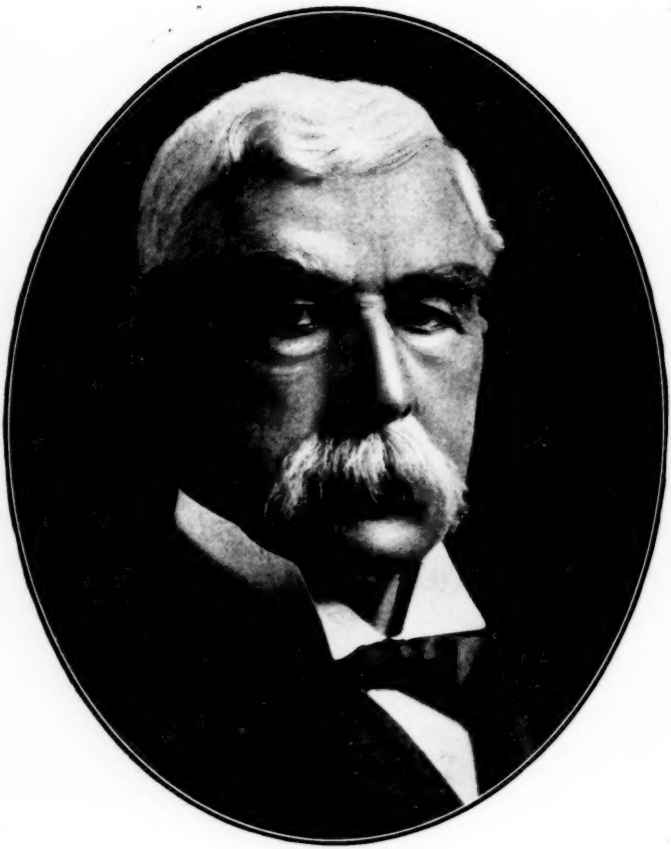

THE LATE D. HUTCHEON, M.R.C.V.S.